ORDER NO. VSD9903M604

Service Manual

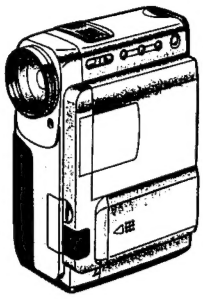
Panasonic Mini DV PAL

Digital Video Camera Recorder

AG-EZ15E

AC Adaptor

VW-AD7E



SPECIFICATIONS

ITEM	SPECIFICATION
POWER	Source: Battery Pack; 7.2 V DC AC Adaptor; 7.9 V DC Consumption: During Camera Recording Using The LCD; 5.1 W During Camera Recording Using The Viewfinder; 4.3 W
RECORDING FORMAT	Digital Video SD Format
TAPE FORMAT	Mini DV Cassette Tape (Tape width 6.35 mm)
TAPE SPEED	SP mode: 18.83 mm/s LP mode: 12.57 mm/s Record/ Playback Time SP mode: 80 min. with DVM80 LP mode: 120 min. with DVM80
CAMERA	PICK-UP ELEMENT: CCD (Charge Coupled Device)
	STANDARD ILLUMINATION: 1,400 lux
	MINIMUM REQUIRED ILLUMINATION: 1 Lux
	LENS: 10 : 1 Power Zoom Focal Length: 3.6–36.0 mm Macro (Full Range AF), Auto Iris, F1.8 Filter Diameter: 30.5 mm
	IMAGE SENSOR: 1/4 inch CCD Image Sensor
	VIEWFINDER: 0.5 inch Colour Electronic Viewfinder 2.5 inch Colour LCD Monitor
VIDEO	RECORDING FORMAT: Digital Component
	TELEVISION SYSTEM: CCIR; 625 Lines, 50 Fields PAL Colour Signal

ITEM	SPECIFICATION
VIDEO	VIDEO OUTPUT LEVEL: 1.0 Vp-p, 75Ω (OUTPUT TERMINAL BOX, AV OUT) S-VIDEO OUTPUT LEVEL; Y: 1.0 Vp-p, 75Ω C: 0.3 Vp-p, 75Ω (OUTPUT TERMINAL BOX)
AUDIO	RECORDING FORMAT: PCM Digital Recording; 16 bit (48 kHz/2 ch) 12 bit (32 kHz/4 ch)
	MIC IN LEVEL: –70 dBV, 5.6 kΩ (OUTPUT TERMINAL BOX) OUTPUT LEVEL: 316 mV, 600Ω (OUTPUT TERMINAL BOX, AV OUT)
DIGITAL STILL PICTURE	Digital Still Picture Output, Control Signal Input/Output (Transfer rate: max. 115 kbps)
DIGITAL INTERFACE	DV Output Terminal (i. LINK, 4 pin))
MICROPHONE	Stereo
SPEAKER	1 round speaker ϕ 20 mm
OPERATING TEMPERATURE	0–40°C
OPERATING HUMIDITY	10–80%
WEIGHT	Approx. 440 g (without Battery Pack)
DIMENSIONS	Approx. 54 (W)×118 (H)×86 (D) mm

Weight and dimensions shown are approximate.
Specifications are subject to change without notice

Panasonic

⚠WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

INTRODUCTION

This Service Manual contains technical information such as General Description, Adjustment Procedures, Block Diagrams / Schematic Diagrams / C.B.A. Diagrams, Exploded Views / Parts Lists and Battery Charger VW-AD7E which service personnel to understand and service the Panasonic Digital Video Camera Recorder model AG-EZ15E.

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CONTENTS

INTRODUCTION

Caution for AC CORD (VJA0940 type)

Information for Your Safety

IMPORTANT

Your attention is drawn to the fact that recording of pre-recorded tapes or discs or other published or broadcast material may infringe copyright laws.

WARNING

To reduce the risk of fire or shock hazard, do not expose this equipment to rain or moisture.

CAUTION

To reduce the risk of fire or shock hazard and annoying interference, use the recommended accessories only.

FOR YOUR SAFETY

■DO NOT REMOVE THE OUTER COVER.

To prevent electric shock, do not remove the cover. No user serviceable parts inside. Refer servicing to qualified service personnel.

Caution for AC Mains Lead

For your safety, please read the following text carefully.

This appliance is supplied with a moulded three-pin mains plug for your safety and convenience.
A 5-ampere fuse is fitted in this plug.
Should the fuse need to be replaced please ensure that the replacement fuse has a rating of 5 amperes and it is approved by ASTA or BSI to BS1362.
Check for the ASTA mark ⓐ or the BSI mark ⓚ on the body of the fuse.

If the plug contains a removable fuse cover you must ensure that it is refitted when the fuse is replaced.
If you lose the fuse cover, the plug must not be used until a replacement cover is obtained.
A replacement fuse cover can be purchased from your local Panasonic Dealer.

If the fitted moulded plug is unsuitable for the socket outlet in your home then the fuse should be removed and the plug cut off and disposed of safety.
There is a danger of severe electrical shock if the cut off plug is inserted into any 13-ampere socket.

If a new plug is to be fitted please observe the wiring code as shown below.
If in any doubt, please consult a qualified electrician.

■IMPORTANT

The wires in this mains lead are coloured in accordance with the following code:

Blue: Neutral
Brown: Live

As the colours of the wires in the mains lead of this appliance may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:

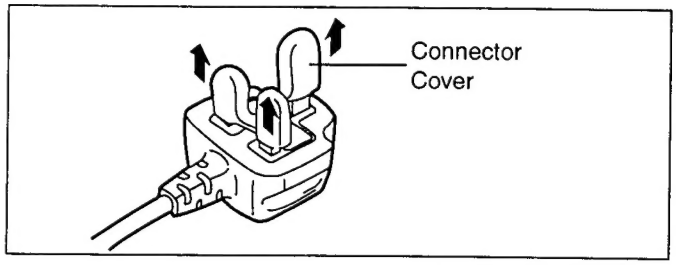
the wire which is coloured BLUE must be connected to the terminal in the plug which is marked with the letter N or coloured BLACK.

The wire which is coloured BROWN must be connected to the terminal in the plug which is marked with the letter L or coloured RED.

Under no circumstances should either of these wires be connected to the earth terminal of the three pin plug, marked with the letter E or the Earth Symbol ⏚.

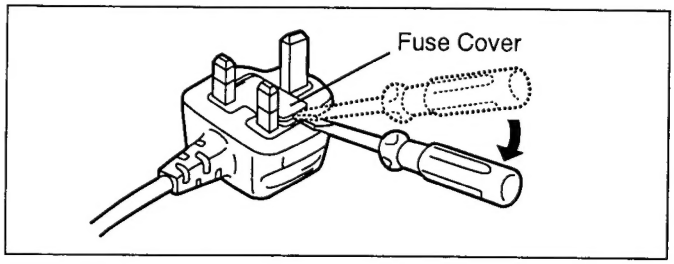
■Before use

remove the Connector Cover as follows.

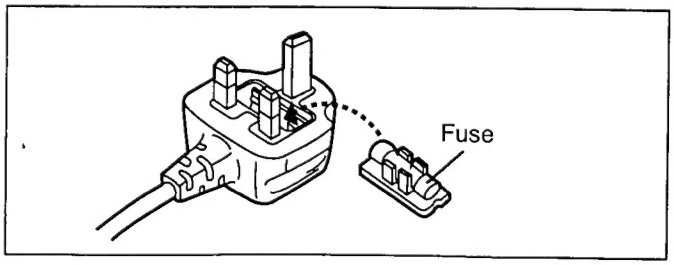


■How to replace the Fuse

1. Remove the Fuse Cover with a screwdriver.



2. Replace the fuse and attach the Fuse cover.



ADDENDUM

VTR Main C.B.A. and Mechanical Chassis

When a parts replacement on the VTR Main C.B.A. and Mechanical Chassis is required, please replace the assembly part (VTR Main C.B.A. and/or Mechanical Chassis Unit).

Page 3

3. Preparation for Electrical Adjustment

It describes recommendation of EVR adjustment system from Video Equipment Division.
The following electrical adjustment procedures are recommended by Video system division.

3. PREPARATION FOR ELECTRICAL ADJUSTMENT

3-1. Measuring Equipment

Dual Trace Oscilloscope	Voltage Range	---------	0.001 to 50V/Div
	Frequency Range	---------	DC to 100MHz
	Probes	---------	10:1 and 1:1
DVM (Digital Volt Meter)			
Frequency Counter	Frequency Range	---------	0 to 150MHz

3-2. Adjustment System

3-2-1. With Measuring Board VFK1308P

The VFK1308P has 2 types of RS-232C connectors (9pin D-sub connector and M3 RS-232C connectors). When using with the VFK1308P in the adjustment system, an ordinary 9-pin RS-232C straight cable can be connected between the measuring board and personal computer. In this case, the RS-232C select switch on the measuring board should be selected at D-sub position.

Other type which supplied from Video Equipment Division has only M3 RS-232C connector.

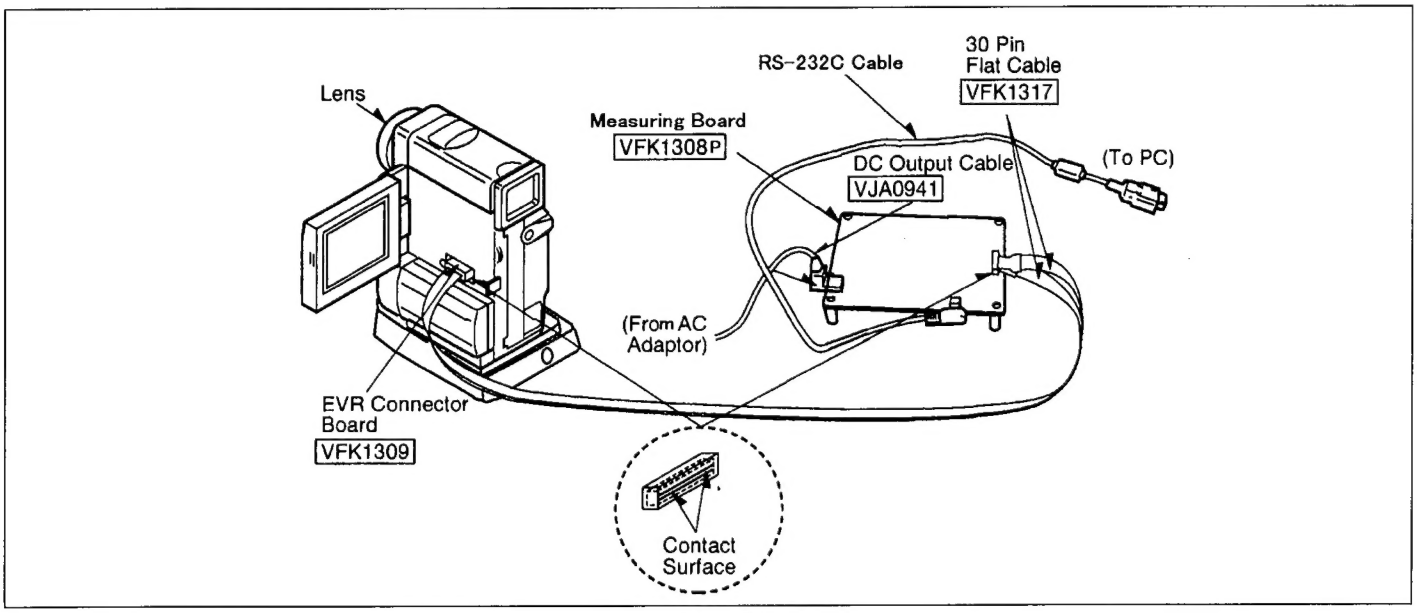


Fig. E1

3-2-2. System Hook up Procedures

1. Unscrew the screw and remove the EVR Cover as shown in Figure E2 .

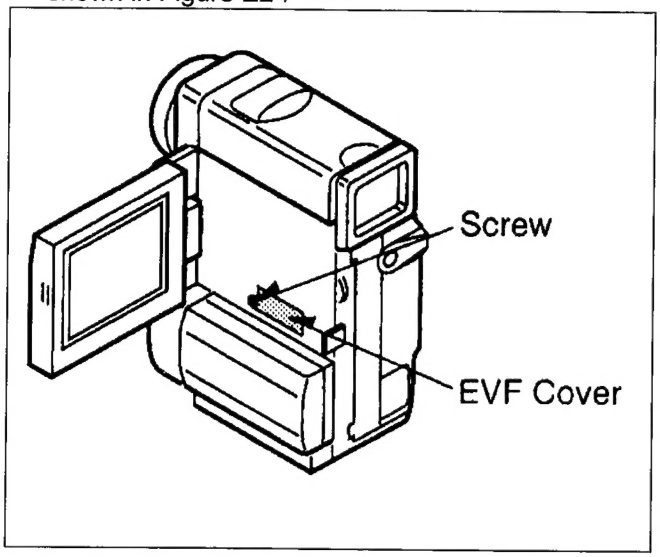


Fig. E2

2. Connect the 2 pcs of 30 pin flat cables between P101 / P102 on the Measuring Board, and 2 connectors on the Connector Board.
   Make sure that the contact surface of 2 pcs. of 30 pin Flat Cables are inner side and direction of the Connection Board is as shown in Figure E3.

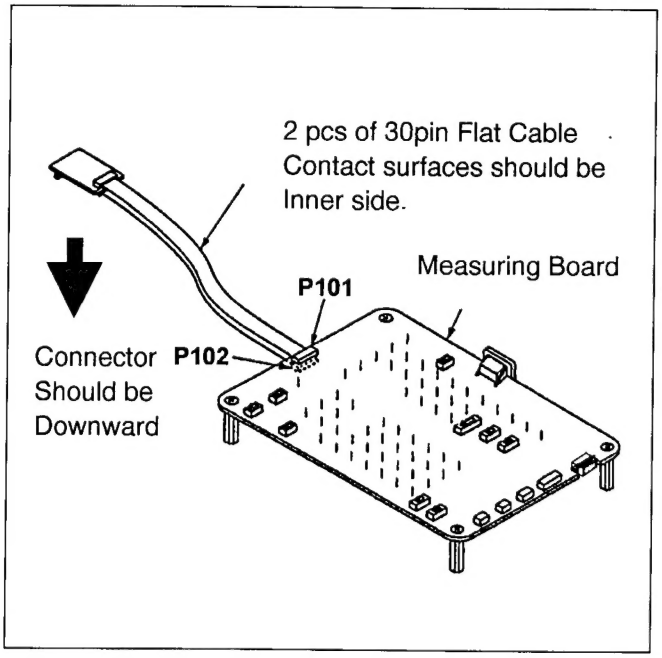


Fig. E3

3. Set the Connector Board with the 30 pin Cables to the unit as shown in Figure E6..
   Make sure that the direction of the Connection Board is correctly fit as shown in Figure E4.

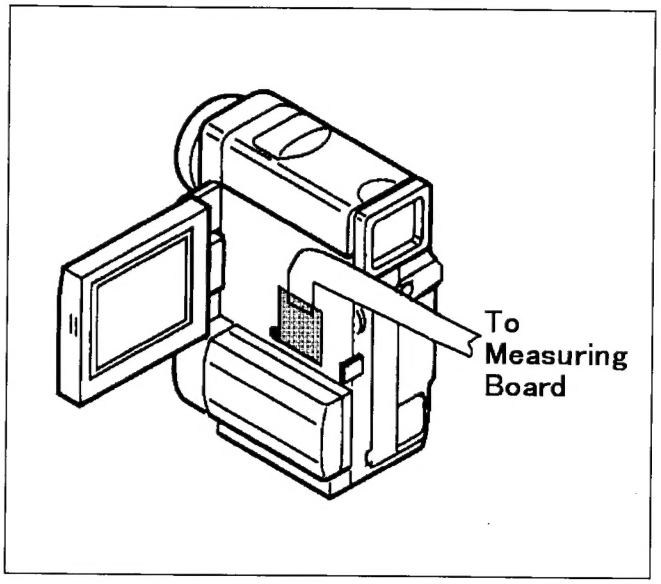


Fig. E4

4. Connect the AC adaptor or set the Battery to the unit.
5. Connect an ordinary 9 pin RS-232C cable between the Measuring Board and RS232C connector on Personal Computer as shown in Figure E1.
8. Connect the 4 pin 6V/DC Power cable between AC adaptor or DC power supply unit.

3-2-3. Lighting System

1) In the camera room using halogen lamps.

The camera adjustments should be performed under the following lighting condition.

Colour Temperature	: 3100 K°
Lamination	: 2000 Lux

2) Using "TATSUJIN" light box

If the camera room or halogen lighting system is not available, "TATSUJIN" light box can be used as shown in Figure E5.

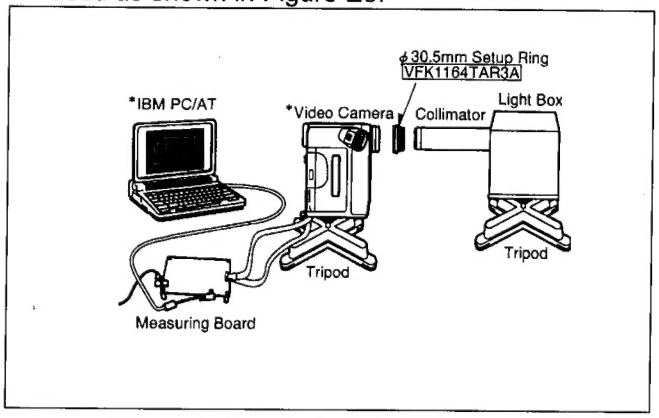


Fig. E5

3-4. Special Fixtures and Tools

In order to keep the factory adjustment specifications, the following special tools should be used to conduct mechanical, electrical adjustments and servicing.

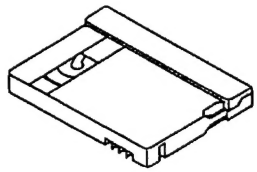
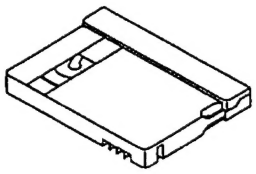
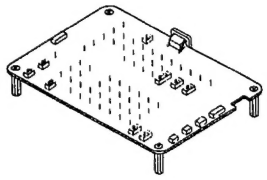
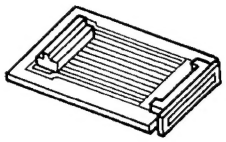
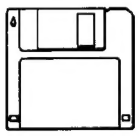
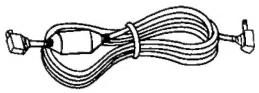
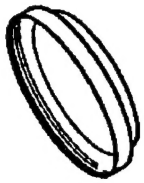
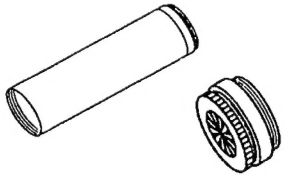
VFM3010EDS Alignment Tape (Colour Bar) 	**VFK1233** Tape End/Beg. Sensor. Cassette 	**VFK1308P** Measuring Board 	**VFK1309** EVR Connector Board 
VFK1515 EVR Adjustment Software 	---------- Ordinary 9pin RS-232C Cross Cable 	**VFK1317** 30pin Flat Cable 	**VJA0941** DC Cable 
VFK1164TAR3A 30.5mm Attachment Ring 	**VFK1164TCM01** Collimator Set (with Focus Chart) 	**VFK1164TFCB1** Color Chart 	**VFK1164TFGS1** Gray Scale Chart 
VFK1164TFWC1 White Chart 	**VFK0374** C12 Color Conversion Filter 		

Fig. E6

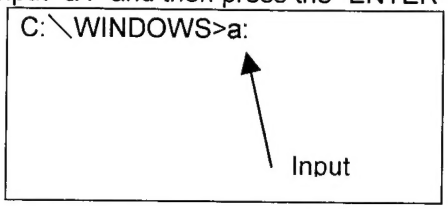
3-5. PC EVR (Adjustment) Software

3-5-1. Boot Up the Adjustment Software

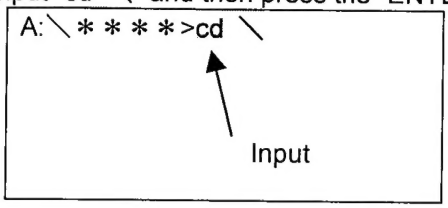
1. Power ON the Personal Computer.
   Windows 95 is set up (AUTO).
2. Restart the PC in Dos mode.
3. Insert the EVR software floppy disk (VFK1515) into the FDD drive of the PC.

	Name of Directory (Folder)	Name of Execute File
AG-EZ15E	Agez15e	ex1. exe

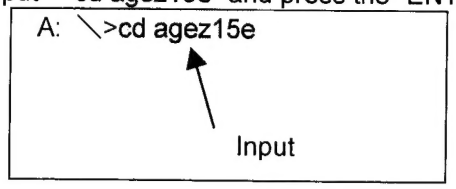
4. Boot up the EVR program as the following steps.
   1) Input "a :" and then press the "ENTER" key.



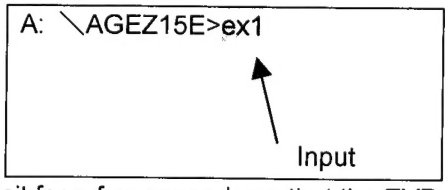
   2) Input "cd \" and then press the "ENTER" key.



   3) Input "cd agez15e" and press the "ENTER" key.



   4) input "ex1" and then press the "ENTER" key.
   AG-EZ10



   5) Wait for a few seconds so that the EVR adjustment program is started.
   6) For the adjustments, follow the program display.

3-5-2. How to Use the Main Menu

Select a Sub Menu to check, adjust the unit and etc. by pressing ↑ ↓ (UP/DOWN) Key in Main Menu. Then, press "ENTER" Key. The Sub Menu will be displayed.

Note: Menu (pages) 3 through 6 are needed for adjustment.

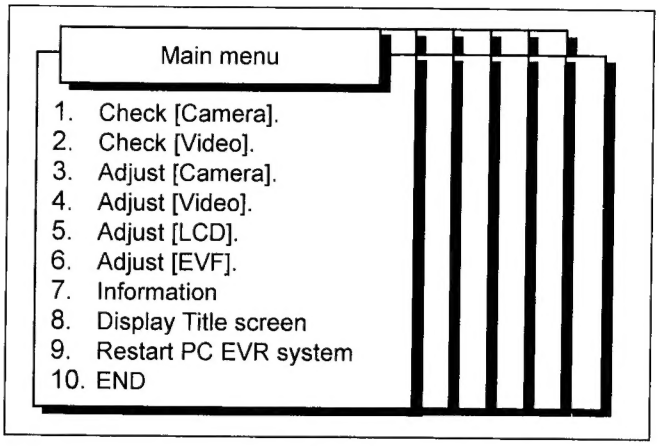


Fig. E7

With using ←→ keys, also the menu can be changed.

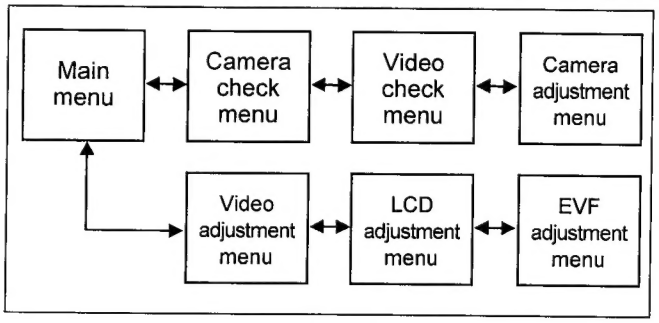


Fig. E8

3-5-3. Introduction of the Sub Menu

1) Camera Check Menu

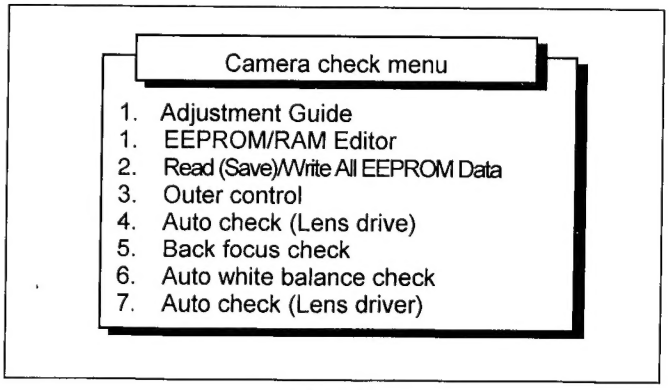


Fig. E9

2) Video Check Menu

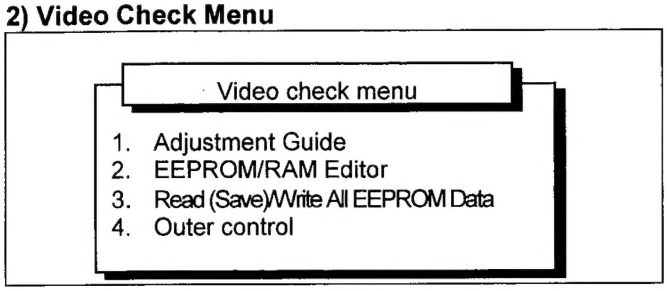


Fig. E10

3) Camera Adjustment Menu

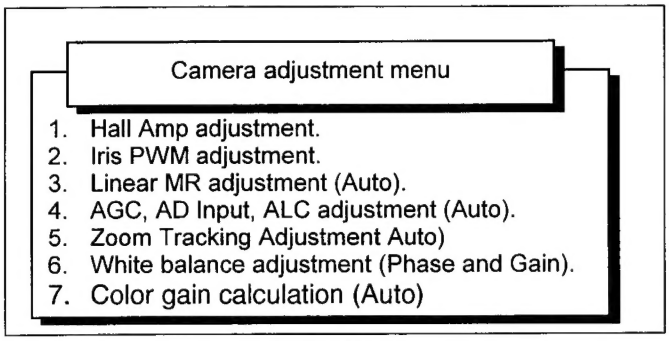


Fig.E11

4) Video Adjustment Menu

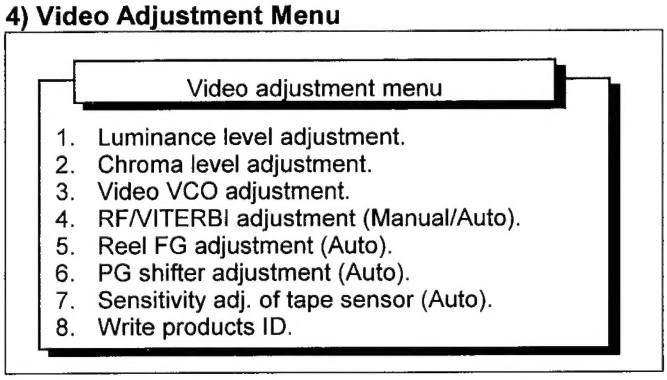


Fig. E12

5) LCD Adjustment Menu

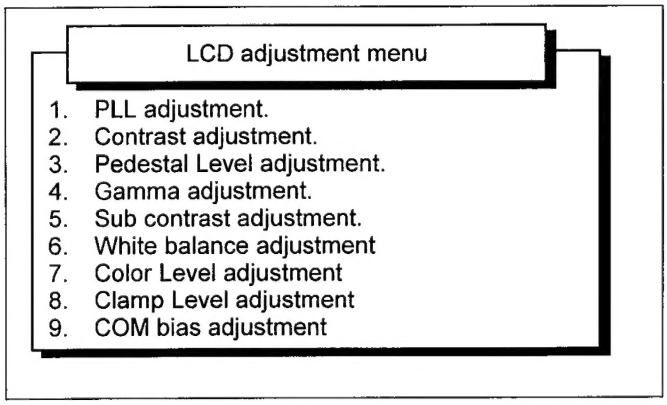


Fig. E13

6) EVF Adjustment Menu

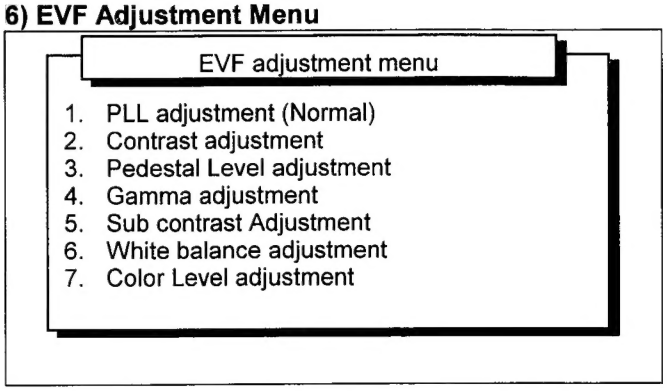


Fig. E14

3-5-4. Restoration of Connecting Error

This program checks connecting condition with the movie all the time.

When the movie power is off, or VTR is reset, or cable is disconnected during servicing, restart the program by pressing "CTRL" key and "BREAK" key together.

3-5-5. Waveform Illustration

This program displays the waveform illustration, when "F2" key is pressed in the adjustment mode.

Be sure to save both the EEPROM data into the personal computer before performing service and adjustment, in order to avoid any accidental data loss.

3-5-6. How to Save Camera EEPROM Data

1) Select "1. Check [Camera]." In the Main menu, and then press the "Enter" key.
2) Select "3. Read [Save]/Write All EEPROM data" in the Camera check menu, and then press the "Enter" key.
3) Select "5. Save all data of EEPROM" in Read [Save]/Write All EEPROM data menu, and then press the "Enter" Key.
4) Input the File name and, then press the "Enter" key. The data of EEPROM can be stored in the personal computer.

3-5-7. How to Save VTR EEPROM Data

1) Select "2. Check [Video]." In the Main menu, and then press the "Enter" key.
2) Select "3. Read [Save]/Write All EEPROM data" in the Video check menu, and then press the "Enter" key.
3) Select "2. Save all EEPROM data" in Read [Save]/Write All EEPROM data menu, and then press the "Enter" key.
4) Input the File name, and then press "Enter" key.
   The data of EEPROM will be stored in the personal computer.

3-5-8. How to REWRITE Saved data

When it becomes impossible to adjust during service and adjustment, rewrite the saved data which stored in paragraphs 3-5-6., 3-5-7. to the EEPROM as follows. And readjust.

3-5-9. How Rewrite Camera Saved Data

1) Select "1. Check [Camera]." In the Main menu, and then press the "Enter" key.
2) Select "3. Read [Save]/Write All EEPROM data" in the Camera check menu, and then press the "Enter" key.
3) Select "6. Data write using stored file" in Read [Save]/Write All EEPROM data menu, and then press the "Enter" key.
4) Input the saved file name, and then press the "Enter" key.
5) The data can be written in the EEPROM.

3-5-10. How Rewrite Video C.B.A. Saved Data

1) Select "2. Check [Video]." In the Main menu, and then press the "Enter" key.
2) Select "3. Read [Save]/Write All EEPROM data" in the Video check menu, and then press the "Enter" key.
3) Select "3. Writing from the stored data files" in the Read [Save]/Write All EEPROM data menu, and then press "Enter" key.
4) Input the saved file name, and then press the "Enter" key.
5) The data will be written in the EEPROM .

3-6. VTR Main C.B.A. REPLACEMENT

3-6-1. Camera Data

In case that the VTR Main C.B.A. is replaced, be sure to write the data to Camera EEPROM on the VTR main C.B.A. as follows.

1. Select "1. Check [Camera]." In the Main menu, and then press the "Enter" key.
2. Select "3. Read [Save]/Write All EEPROM data" in the Camera check menu, and then press the "Enter" key.
3. Select "6. Data write using stored file" in the Read [Save]/Write All EEPROM data menu, and then press the "Enter" key. Input the saved file name, and then press the "Enter" key.
   OR;
   Select "7. Data write with Average data," and then press the "Enter" key. And press the "Enter" key once again.

3-6-2. VTR Data.

In case that the VTR Main C.B.A. is replaced, be sure to write the data to the EEPROM on the VTR Main C.B.A. as follows.

1. Select "2. Check [Video]." In the Main menu, and then press the "Enter" key.
2. Select "3. Read [Save]/Write All EEPROM data" in the Video check menu, and then press the "Enter" key.
3. Select "3. Writing from stored data files." In Read [Save]/Write All EEPROM data menu, and then press the "Enter" key. Input the saved file name, and then press the "Enter" key.
   OR;
   Select "4. Writing of fixed/average values," and then press the "Enter" key. And press the "Enter" key once again. Then, input ID Number as follows.

3-6-3. How to input ID Number

When writing the data to the EEPROM after replacing VTR Main C.B.A.;
When selecting "4. Writing of fixed/average values," ID Number needs to be input.
When selecting "3. Writing from stored data files," ID Number stored data file will be written automatically.
When writing ID Number from the saved data which is stored in 3-5-7.

1. Select "2. Check [Video]." In the Main menu, and then press the "Enter" key.
2. Select "3. Read [Save]/Write All EEPROM data" in the Video check menu, and then press the "Enter" key.
3. Select "5. Writing ID from the stored file." In Read [Save]/Write All EEPROM data menu, and then press the "Enter" key. Input the saved file name, and then press the "Enter" key.

   The ID Number will be automatically written.

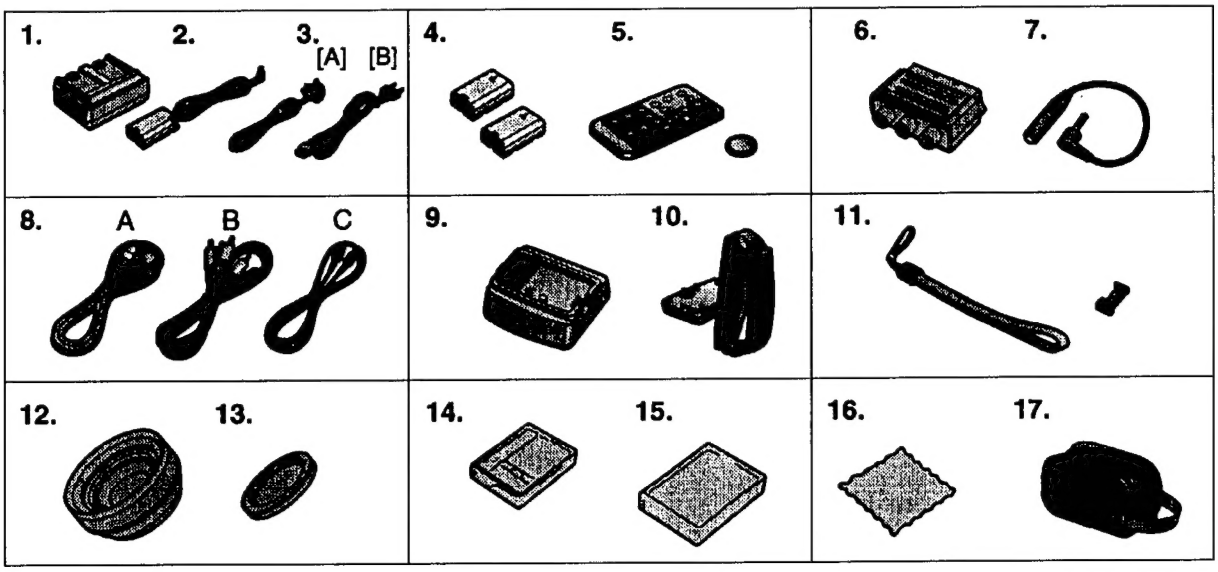
When the original ID information can not be read because of the destruction of EEPROM etc.:

1. Select "4. Adjust [Video]." In Main menu, and then press "Enter" key.
2. Select "9. Write products ID" in the Video adjustment menu, and then press the "Enter" key.
3. ID Number will be written automatically.

Note: The adjusted data has been written to the EEPROM after each adjustments.

Page 1-1.
Standard Accessories

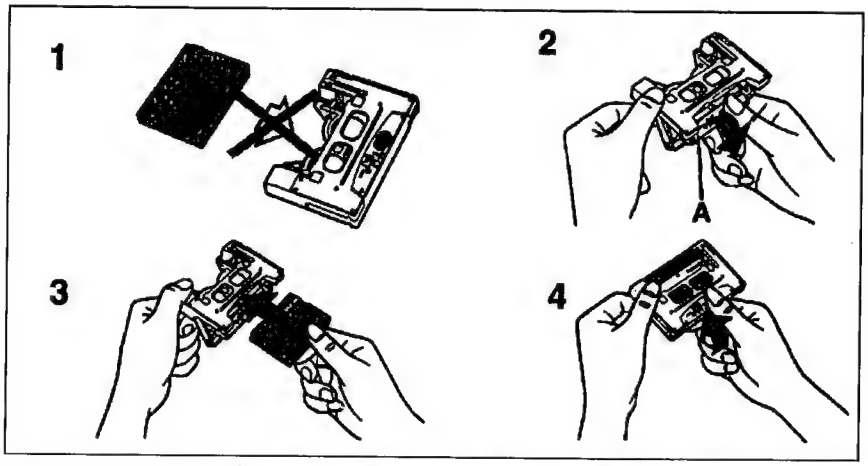
It shows the standard accessories of NV-EX1(PAL)
The following list shows the accessories of AG-EZ15.



Standard Accessories

1. **AC Adaptor (→ 16, 18, 140)**
   To supply power to the Movie Camera.
   To charge the Battery.
2. **DC Input Cable (→ 16)**
   To connect the AC Adaptor to the Movie Camera.
3. **AC Mains Cables (→ 16, 18)**
   To connect the AC Adaptor to an AC mains socket.
   [A] England and Hong Kong only
   [B] Areas other England and Hong Kong
4. **Battery Pack (→ 18)**
   To supply the Movie Camera with power.
5. **Remote Controller and Button-Type Battery (→ 100, 108)**
6. **21-pin Adaptor (→ 54, 114, 116, 118)**
7. **Headphone Conversion Adaptor (→ 156)**
8. **A. AV Cable (PHONO - M3) (→ 54, 114)**
   B. AV Cable (PHONO - PHONO) (→ 54, 114, 116, 118)
   C. S-Video-Cable (→ 54, 114, 116, 118, 120, 122)
9. **Output Terminal Box [AV ONE TOUCH STATION] (→ 54, 56, 112)**
   Equipped with AV Sockets, Edit Socket and Microphone Socket.
10. **Hand Grip (→ 28)**
11. **Hand Strap (→ 30)**
    Lens Cap Holder for Hand Strap (→ 30)
12. **Wide Conversion Lens (→ 190)**
13. **ND Filter (→ 190)**
14. **Mini DV Cassette (→ 22)**
15. **Cassette Adaptor (→ 126)**
16. **Cleaning Tissue**
    To clean the Lens and the LCD Monitor.
17. **Soft Bag (→ 56)**
    To store the Movie Camera when it is not being used or when you carry it.

The following shows the operating instruction of Cassette Adaptor for DVCPRO.



Cassette Adaptor

It can only be used with S cassettes bearing the DV mark.
It can only be used to play back DV cassettes which are recorded in format.

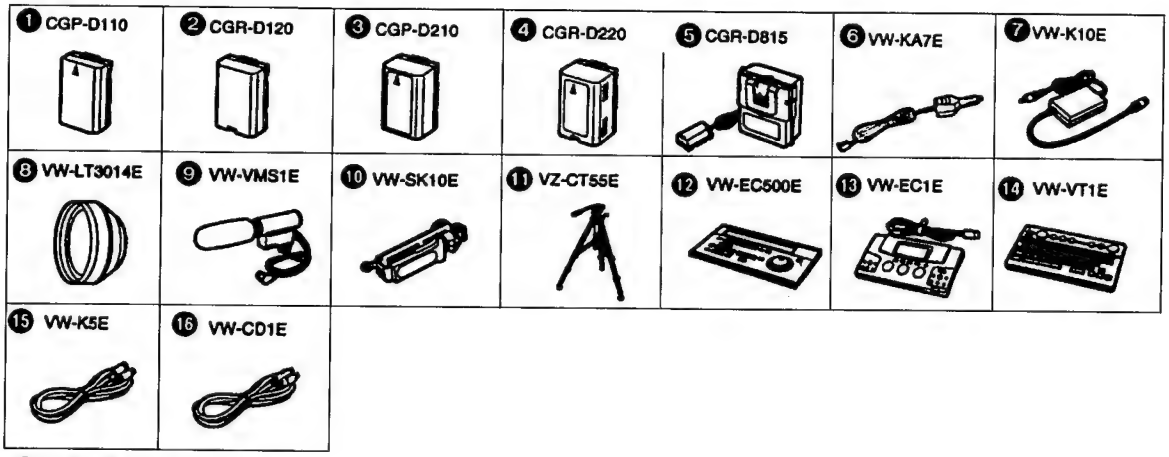
1 **Take care to insert the cassette in the proper direction.**
2 **Open the Cassette Adaptor.**
3 **Insert the Cassette tape.**
4 **Close the Cassette Adaptor.**

- Do not subject the cassette adaptor to strong shocks or vibration as it uses precision parts. Also, do not modify or disassemble the cassette adaptor. After use, remove the DV cassette and store it in its case.
- Do not push down A (rear door) using an unnecessarily large force.

Page 1-30.

Optional Accessories

It shows the optional accessories of NV-EX1(PAL)
The following list shows the optional accessories of AG-EZ15.



Optional Accessories

❶ Battery Pack (Lithium)
❷ Battery Pack (Lithium)
❸ Battery Pack (Lithium)
❹ Battery Pack (Lithium)
❺ Battery Pack (Lithium)
❻ Car Adaptor Cord
❼ 5-Pin Synchro Cord
❽ Tele Conversion Lens
❾ Stereo Zoom Microphone
❿ Shoe Adaptor
⓫ Tripod
⓬ Editing Controller
⓭ Editing Controller
⓮ Video Titler
⓯ Edit Cable
⓰ DV Cable

- Some accessories are not available in some countries.

Memo

Service Information

1. Service Extension Cables

Use the following extension cables when checking or adjusting individual circuit bords.

No.	Part No.	Pin	Part Name	Connection	Q'ty	Remarks
①	VFK1458	70	Flat Cable	PS2001 (VTR Main)-PP2001 (Drive)	1	
②	VFK1284	24	Flat Cable	FP3201 (VTR Main)-Head Amp	1	
③	VFK1442	21	Flat Cable	FP601 (VTR Main)-FP903 (Monitor)	1	
④	VFK1442	21	Flat Cable	FP602 (VTR Main)-FP904 (Monitor)	1	
⑤	VFK1442	21	Flat Cable	FP701 (VTR Main)-Lens Flex.	1	
⑥	VFK1459	39	Flat Cable	FP4201 (VTR Main)-FP4001 (Mic Unit)	1	
⑦	VFK1460	20	Flat Cable	PS201 (VTR Main)-PP291 (CCD)	1	
⑧	VFK1461	20	Flat Cable	FP801 (VTR Main)-E.V.F. (A)	1	
⑨	VFK1462	70	Flat Cable	PS301 (VTR Main)-PP3401 (Operation I/F)	1	
⑩	VFK1463	90	Flat Cable	PP1001 (VTR Main)-PS1001 (Power)	1	
⑪	VFK1464	7	Flat Cable	FP3301 (VTR Main)-AV Jack	1	
⑫	VFK1441	8	Flat Cable	FP2204 (VTR Main)-Mecha. Flex.	1	
⑬	VFK1465	5	Flat Cable	FP6303 (VTR Main)-Cassette Down Flex.	1	
⑭	VFK1443	18	Flat Cable	FP2203 (Drive)-Mecha. Flex.	1	
⑮	VFK0977	20	Flat Cable	FP6001 (VTR Main)-Rear Operation U.	1	
⑯	VFK1440	10	Flat Cable	FP6302 (Operation I/F)-VTR Operation U.	1	
⑰	VFK1364	14	Flat Cable	FP1001 (Power)-Battery Catcher	1	
⑱	VFK1480	6	Flat Cable	FP6702 (Operation I/F)-Zoom Operation U.	1	
⑲	VFK1443	18	Flat Cable	FP2201 (Drive)-Mecha. Cap.	1	
⑳	VFK1440	10	Flat Cable	FP2202 (Drive)-Mecha. Cyl.	1	

2. Service Position

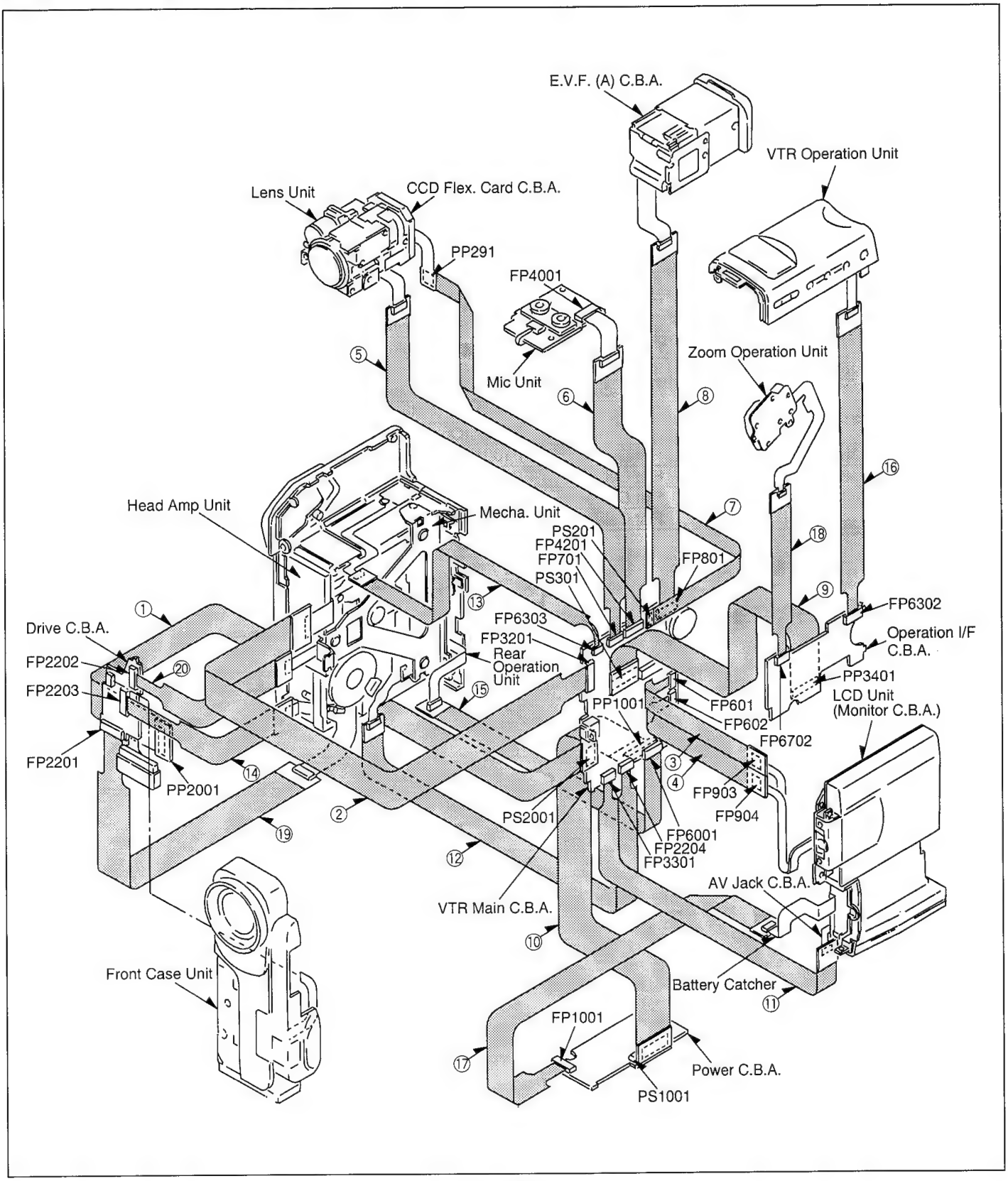


Fig. T1

3. Preparation for Electrical Adjustment

Remove Screw and EVR Cover which is located on the Side Case Unit as follows.

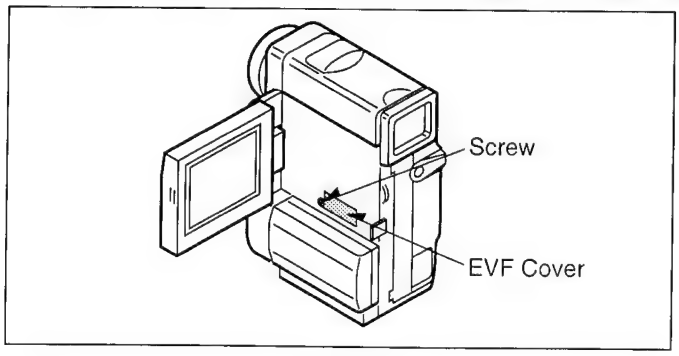


Fig. E1

Then connect the following cables as shown in Fig. E2.

Part No.	Part Name	Q'ty	Remarks
VFK1395	232C (M3) I/F Cable	1	
VFK1308E	Measuring Board	1	
VFK1309	EVR Connector Board	1	
VFK1317	30 Pin Flat Cable	2	
VJA0941	DC Output Cable	1	For AC Adapter
VFK1164TAR3A	Setup Ring (ϕ30.5 mm)	1	For Collimator

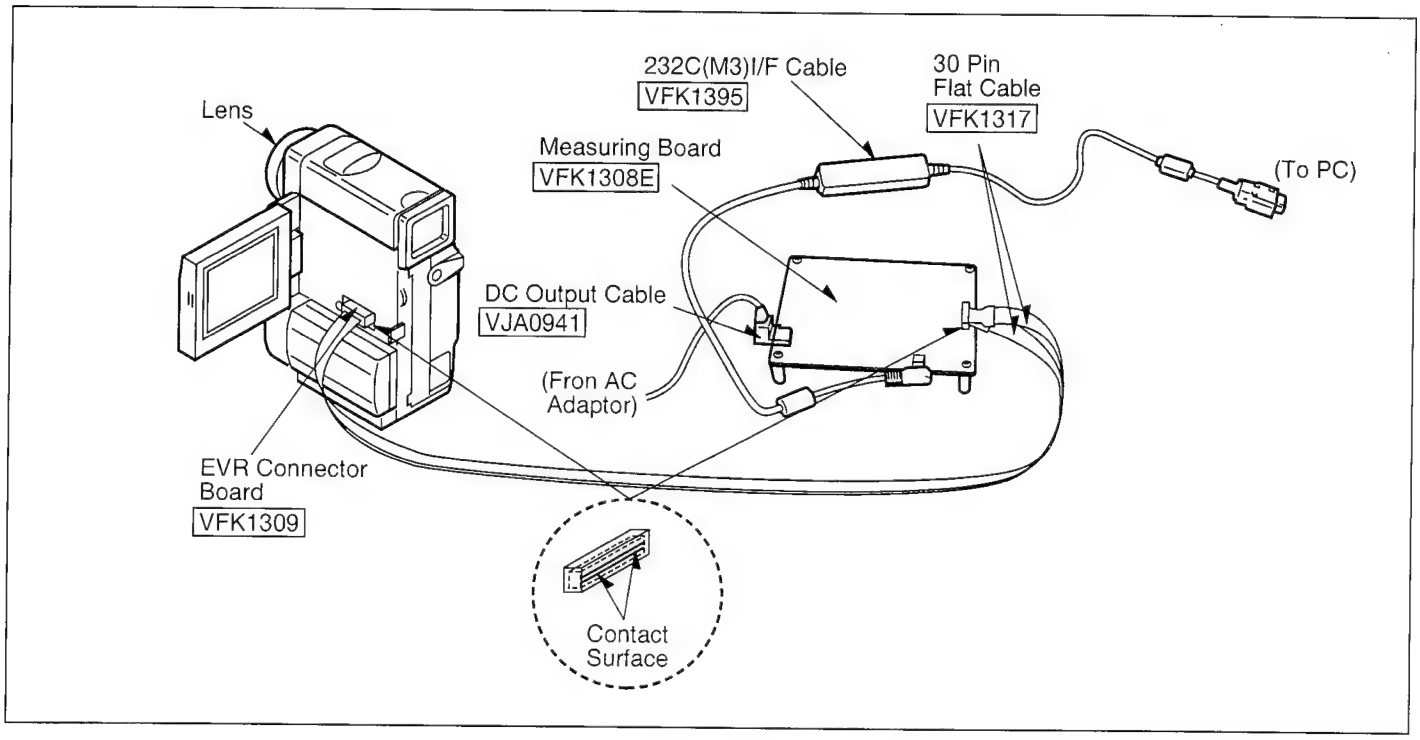


Fig. E2

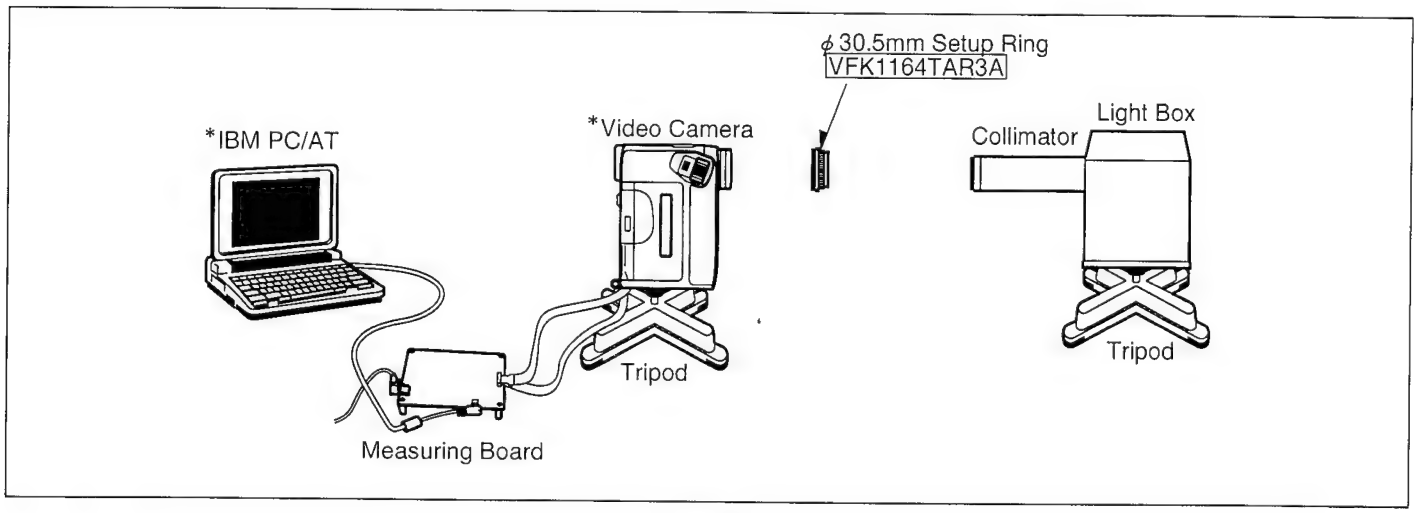
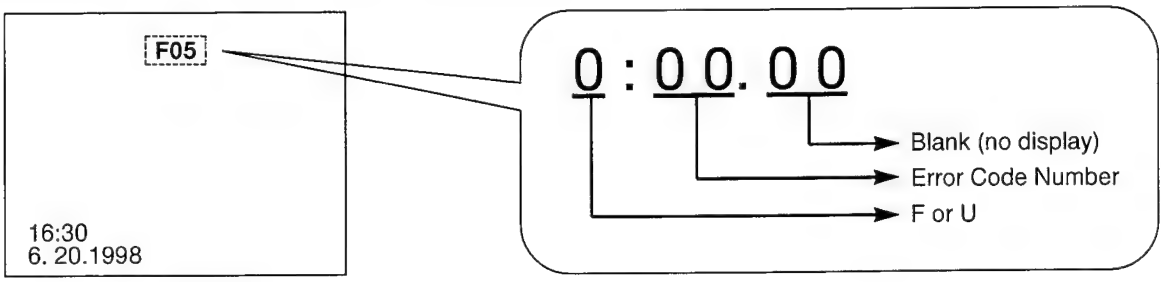


Fig. E3

4. Service Mode

When undesirable conditions occurred, the error code is displayed on the EVF or LCD Monitor.
Also, the Camera LED is flashed according to the error code as follows.



EVF or LCD Monitor

DISPLAY	CONDITION	POWER OFF TIMING / POWER LED FLASHING TIMING
F01	T-Reel Lock	After 1 minute flashing the LED
F02	S-Reel Lock	After 1 minute flashing the LED
F03	Unloading Lock	After 1 minute flashing the LED
F04	Loading Lock	After 1 minute flashing the LED
F05	Cylinder Lock	After 1 minute flashing the LED
F31	Data Transmission Error	Not turning OFF
F51	Focus Motor Lock	Not turning OFF Power LED is flashed at 1 Hz timing
F52	Zoom Motor Lock	Not turning OFF Power LED is flashed at 1 Hz timing
U10	Dew Detection	After 18 seconds flashing the LED Power LED is flashed at 1 Hz timing
U11	Head Clogging	Not turning OFF

5. How to replace the Lithium Battery (Procedure)

1. Remove the 7 Screws. (See Fig. B1)
2. Open the Rear Operation Unit.
3. Unsolder the Lithium Battery "VL1220/1FC" and then replace the new one. (See Fig. B1)

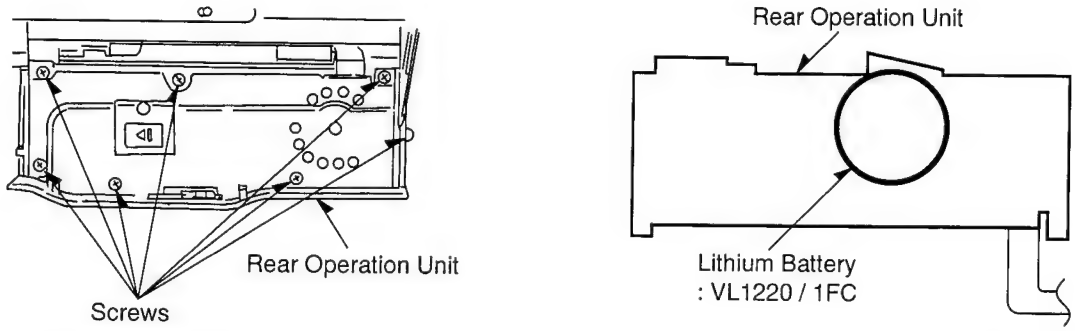


Fig. B1

NOTE:

The lithium battery is a critical component (Type No.: VL1220/1FC Manufactured by Panasonic.)
It must never be subjected to excessive heat or discharge.
It must therefore only be fitted in equipment designed specifically for its use.
Replacement batteries must be of the same type and manufacture.
They must be fitted in the same manner and location as the original battery, with the correct polarity contacts observed.
Do not attempt to re-charge the old battery or re-use it for any other purpose.
It should be disposed of in waste products destined for burial rather than incineration.

CAUTION

Danger of explosion if battery is incorrectly replaced.
Replace only with the same or equivalent type recommended by the equipment manufacturer.
Discard used batteries according to manufacturer's instructions.

VARNING

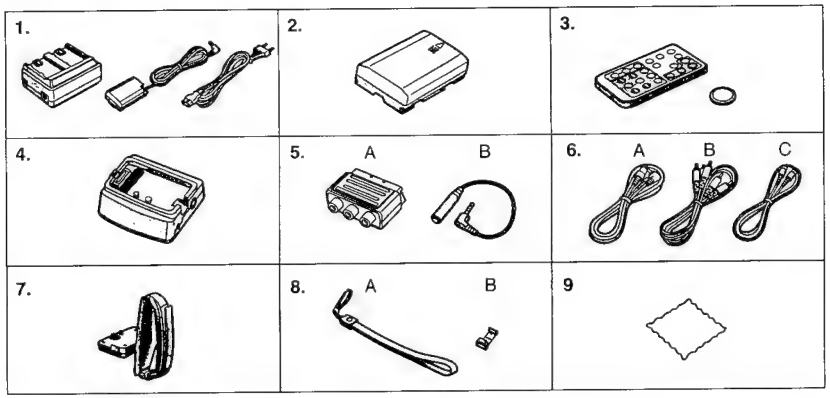
Explosionsfara vid felaktigt batteribyte.
Använd samma batterityp eller en ekvivalent typ som rekommenderas av apparattillverkaren.
Kassera använt batteri enligt fabrikantens instruktion.

ADVARSEL!

Lithiumbatteri - Eksplosionsfare ved fejlagtig håndtering.
Udskiftning må kun ske med batteri af samme fabrikat og type.
Levér det brugte batteri tilbage til leverandøren.

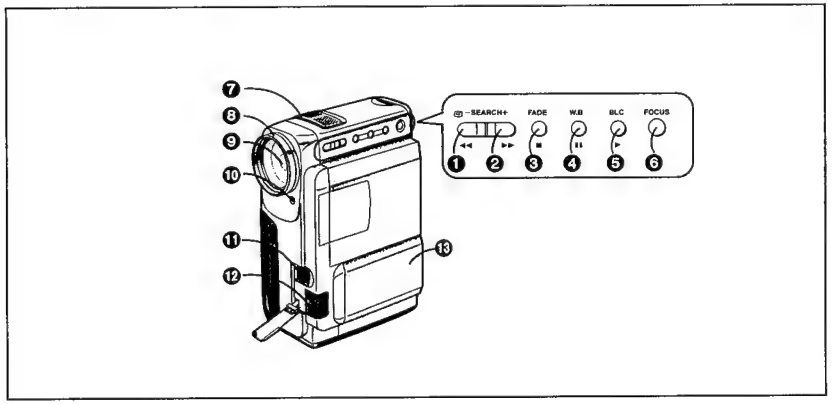
VAROITUS

Paristo voi räjähtää, jos se on virheellisesti asennettu.
Vaihda paristo ainoastaan laitevalmistajan suosittelemaan tyyppiin. Hävitä käytetty paristo valmistajan ohjeiden mukaisesti.



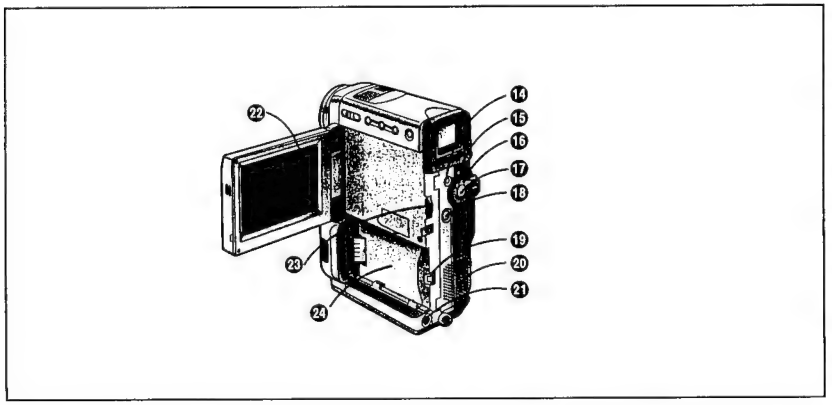
Standard Accessories

1. **AC Adaptor (➔ 16, 18, 140)**
   To supply power to the Movie Camera.
   To charge the Battery.
   DC Input Cable and AC Mains Cable (➔ 16, 18)
   To connect the AC Adaptor to the Movie Camera and to an AC mains socket.
2. **Battery Pack (➔ 18)**
   To supply the Movie Camera with power.
3. **Remote Controller and Button-Type Battery (➔ 100, 108)**
4. **Output Terminal Box [AV ONE TOUCH STATION] (➔ 54, 56, 112)**
   Equipped with AV Sockets, Edit Socket, Digital Still Picture Terminal and Microphone socket
5. **A. 21-pin Adaptor (➔ 54, 114, 116, 118)**
   B. Headphone Conversion Adaptor (➔ 156)
6. **A. AV Cable (PHONO - M3) (➔ 54, 114)**
   B. AV Cable(PHONO - PHONO) (➔ 54, 114, 116, 118)
   C. S-Video-Cable (➔ 54, 114, 116, 118, 120, 122)
7. **Hand Grip (➔ 28)**
8. **A. Hand Strap (➔ 30)**
   B. Lens Cap Holder for Hand Strap(➔ 30)
9. **Cleaning Tissue**
   To clean the Lens and the LCD Monitor.



Controls and Components

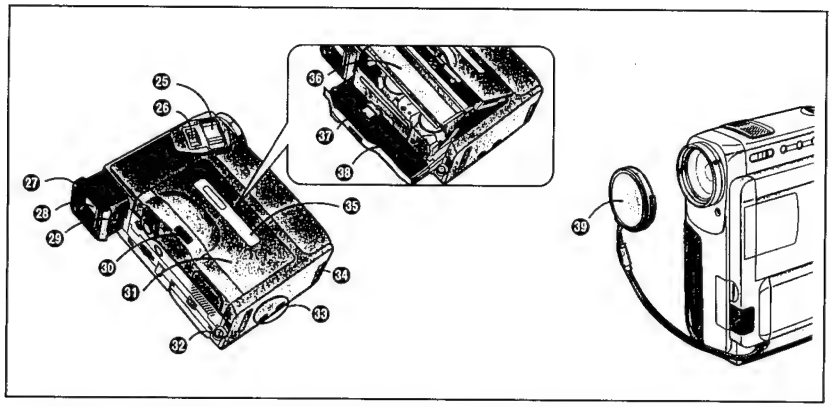
1. **Reverse Search Button [–SEARCH] (➔ 58)**
   Rewind/Review Button [◀◀] (➔ 48)
   Recording Check Button [⟲] (➔ 34)
2. **Forward Search Button [SEARCH+] (➔ 58)**
   Fast Forward/Cue Button [▶▶] (➔ 48)
3. **Fade Button [FADE] (➔ 68)**
   Stop Button [■] (➔ 46)
4. **White Balance Button [W.B] (➔ 82, 84)**
   Pause Button [❚❚] (➔ 52)
5. **Backlight Button [BLC] (➔ 34)**
   Play Button [▶] (➔ 46, 48)
6. **Focus Button [FOCUS] (➔ 86)**
7. **Microphone (built-in, stereo)**
8. **MC Protector (➔ 156)**
   To protect the lens against getting damaged.
9. **Lens**
10. **Recording Lamp (➔ 32)**
11. **DV Terminal (i.LINK) [ψ]**
    To output digital signals.
    Connect it to digital video equipment.
    "i.LINK" is the name of the connector in accordance with the International Standard IEEE1394-1995.
    " ψ " is the logo marked on products conforming with the "i.LINK" specifications.
    Inputting digital signals into this Movie Camera is not possible.
12. **White Balance Sensor (➔ 164)**
    Remote Control Sensor (➔ 110)
13. **Battery Holder Cover**
    When attaching the Battery or connecting the DC Input cable, remove this cover.



14. **Menu Button [MENU] (➔ 128)**
15. **Power Lamp**
16. **Selector Switch for Camera Mode/Power Off/ VCR Mode [POWER] (➔ 26, 32, 46, 56)**
17. **Recording Start/Stop Button (➔ 32)**
18. **Photoshot Button [PHOTO SHOT] (➔ 40)**
19. **Battery Eject Lever [BATT. EJECT] (➔ 18)**
20. **Speaker (➔ 46)**
21. **Audio-Video Output Socket [AV OUT] (➔ 54, 114, 156)**
    When a cable is connected to this socket, the Movie Camera's built-in speaker is turned off.
22. **LCD Monitor (➔ 26)**

> Due to limitations in LCD production technology, there may be some tiny bright or dark spots on the LCD Monitor screen. However, this is not a malfunction and does not affect the recorded picture.

23. **Multi-Function Dial [PUSH] (➔ 46, 48, 52, 86, 88, 90, 128)**
24. **Battery Holder**



㉕ Zoom Lever [W/T] (➔ 38)

㉖ Mode Selector Switch [AUTO/MNL/AE SELECT] (➔ 32, 70, 82, 84, 86, 88, 90)

㉗ Eyecup

㉘ Finder (➔ 26)

Due to limitations in LCD production technology, there may be some tiny bright or dark spots on the Finder screen. However, this is not a malfunction and does not affect the recorded picture.

㉙ Eyepiece Corrector Knob (➔ 26)

㉚ Cassette Compartment Open Lever [CASSETTE DOOR OPEN] (➔ 22)

㉛ Upper Cassette Compartment Cover (➔ 22)

㉜ Hand Strap Holder (➔ 30)

㉝ Tripod Receptacle
To mount the Movie Camera on an optional tripod.

㉞ Multi Terminal (➔ 112)

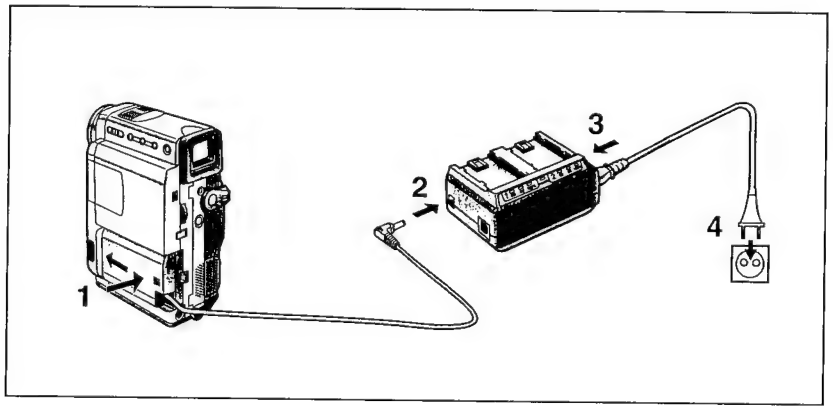
㉟ Cassette Compartment Window (➔ 22)

㊱ Cassette Holder (➔ 22)

㊲ Cassette Eject Button [▲EJECT] (➔ 22, 56)

㊳ Lower Cassette Compartment Cover (➔ 22)

㊴ Lens Cap (➔ 30, 56, 84)



The 3 Types of Power Supplies

1) AC Adaptor (supplied) to supply power from an AC mains socket
2) Car Adaptor Cord (optional) to supply power from a Cigarette Lighter Socket
3) Battery (supplied) (➔ 18)

■ Supplying Power from an AC Mains Socket

1 Insert the battery-shaped connector of the DC Input Cable into the Battery Holder on the Movie Camera and slide it toward the front until it locks with a click.

2 Connect the other plug of the DC Input Cable to the [DC OUT] Socket on the AC Adaptor.

3 Connect the AC Mains Cable to the AC Adaptor.

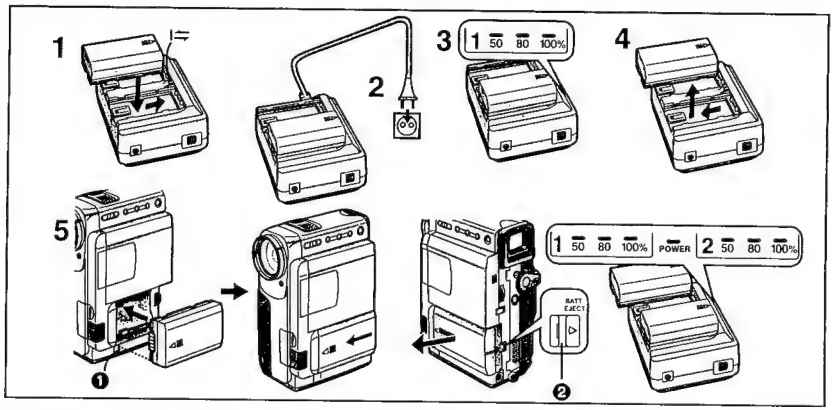
4 Connect the other end of the AC Mains Cable to an AC mains socket.

- Before disconnecting the AC Mains Cable, set the [POWER] Switch on the Movie Camera to [OFF].
- If you use the Movie Camera for a long time, it becomes warm. However, this is normal.

■ Supplying Power from the Cigarette Lighter Socket in a Car

The use of the Car Adaptor Cord (VW-KA7E; optional) together with the AC Adaptor makes it possible to supply power to the Movie Camera in a car for recording and playback. It also allows charging the Movie Camera's Battery.

- After use, be sure to disconnect the Car Adaptor Cord from the Cigarette Lighter Socket.
- Be sure to start the car engine before you connect the Car Adaptor Cord, otherwise the fuse may blow.
- Also read the operating instructions of the Car Adaptor Cord.



■ Supplying Power with the Battery

Before use, fully charge the Battery.

1 Place the Battery on the AC Adaptor as shown above and slide it horizontally until it stops.

2 Connect the AC Mains Cable to an AC mains socket.

3 When all three Charge Lamps on the AC Adaptor are lit, charging is finished.

- The Charge Lamps [50%], [80%] and [100%] flash and then remain lit one after another. These lamps indicate the approximate charging condition reached.

4 Remove the Battery by sliding it in the opposite direction of Step 1 above.
Also disconnect the AC Mains Cable.

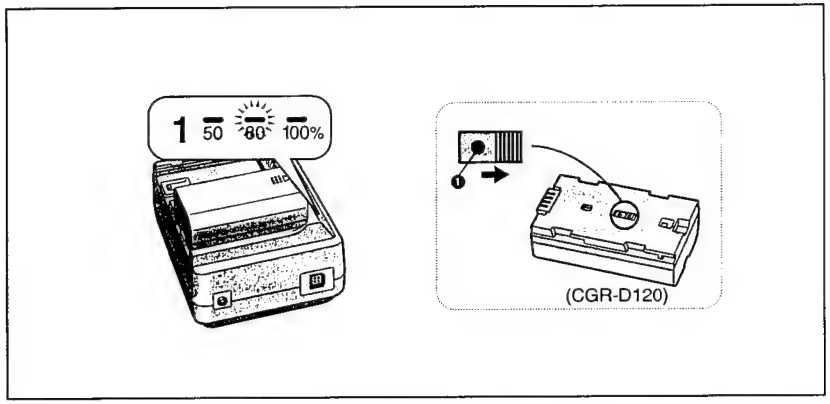
5 After aligning the front edge of the Battery with the mark ❶ at the bottom edge of the Movie Camera, push it in and then slide it toward the front until it locks with a click.

Removing the Battery from the Movie Camera
While pressing the [BATT. EJECT] Lever ❷, slide the Battery toward the rear and then remove it.

- Be careful not to drop the Battery by accident.
- Before removing the Battery, set the [POWER] Switch to [OFF].

Charging Two Batteries
If you attach two Batteries to the AC Adaptor, they will be charged one after the other. To charge, follow Steps 1 - 3 .

- Charging starts from Battery 1. At this time, the Charge Lamps for Battery 2 show the remaining charge in the Battery 2. (If the remaining charge is less than 50%, no Charge Lamp is lit.)



Charging Time and Maximum Time for Continuous Recording

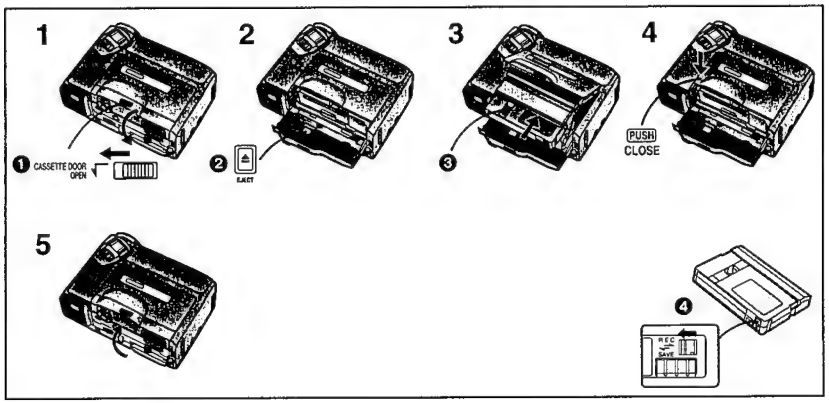
Battery No.	Charging Time	Max. Continuous Recording Time
CGP-D110 (Supplied)	1 h 20 min	1 h 5 min (55 min)
CGR-D120	1 h	1 h 15 min (1 h 5 min)
CGP-D210	1 h 50 min	2 h 10 min (1 h 55 min)
CGR-D220	2 h	2 h 40 min (2 h 20 min)
CGR-D815	5 h 20 min	9 h(7 h 40 min)

(The times shown in the above chart are approximations. The figures in parentheses show the recording time when using the LCD Monitor.)
The times listed above for your information indicate the duration of recording performed at an ambient temperature of 20°C and 60% relative humidity. The charging time may be longer when you charge the Battery at higher or lower temperature.

- During use and Battery charging, the Battery and the Movie Camera's body will becomes warm. This is not a malfunction.
- When you repeatedly stop and restart recording, the recording time per Battery is shorter than listed above.
- If you do not use the Battery for a long time, please read "Precautions for Storage" **(➔ 154)**.

When the Charge Lamps Flash as Warning
If the ambient temperature is extremely low or extremely high, the Charge Lamps on the AC Adaptor flash. They also flash when some malfunction has occurred in the Battery or the AC Adaptor. For details, read "When the Charge Lamps on the AC Adaptor Flash as Warning" **(➔ 152)**.

Using Optional Batteries Equipped with Charge Confirmation Marker
You can use this marker to easily distinguish between charged and discharged Batteries.
For example, slide the knob so that the red dot (●) ❶ is visible after the charging is completed.
(The Battery CGP-D110 is not equipped with a Charge Confirmation Marker.)



Inserting the Cassette

1. **Slide the [CASSETTE DOOR OPEN] Lever ❶ to the left and simultaneously open the Lower Cassette Compartment Cover completely.**
2. **Press the [⏏EJECT] Button ❷.**
   The Cassette Holder slides out.
3. **Insert the cassette with its window in position ❸ shown above.**
4. **Press on the [PUSH CLOSE] mark to close the Upper Cassette Compartment Cover.**
   The Cassette Holder with the cassette slides back inside.
   Confirm that the Cassette Holder has retracted completely.
5. **Close the Lower Cassette Compartment Cover.**

- If the AC Adaptor or Battery is used to supply power, it is possible to insert or eject the cassette without turning on the Movie Camera.
- When inserting the cassette, make sure it faces in the right direction and then push it in until it stops.
- When you insert a cassette onto which you have recorded before, use the Camera Search Function **(➔ 58)** to search for the position from which you want to continue recording.
- When you insert a new cassette, rewind the tape to the beginning before starting to record.

Preventing Accidental Erasure of Recordings
Opening the cassette's erasure prevention slider ❹ (sliding it in the direction of the [SAVE] arrow) prevents recording. To record again, close the erasure prevention slider (slide it in the direction of the [REC] arrow).

If the Cassette Holder Does Not Slide Back in
- Press on the [PUSH CLOSE] mark and close the Upper Cassette Compartment Cover securely.
- Turn the Movie Camera off and then on again.
- Check if the Battery is discharged.

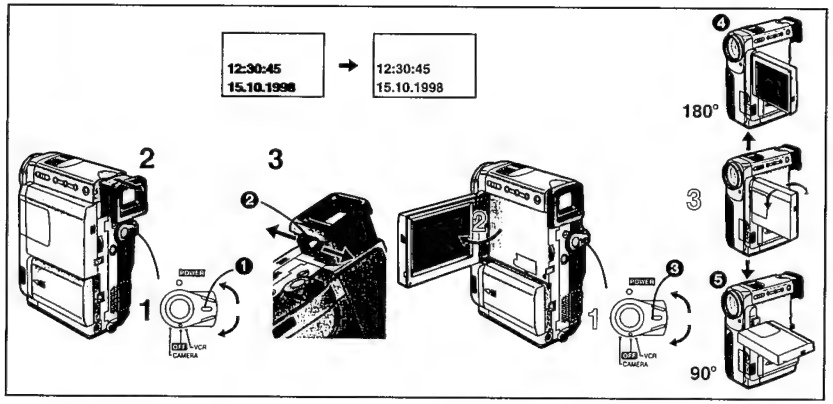
If the Cassette Holder Does Not Slide Out
- Close the Lower Cassette Compartment Cover completely and then open it again.
- Check if the Battery is discharged.

■ LP Mode

The desired recording speed can be selected with [REC SPEED] on the [CAMERA MENU2] Menu.

If you select the LP Mode, the possible recording time is 1.5 times as long as in the SP Mode.
Recording in the LP mode does not deteriorate the picture quality. However, the playback picture may contain mosaic-like patterns and certain functions may be restricted.

- In the following cases, mosaic-like patterns may appear in the playback picture, or the picture may not be played back correctly:
  - When a cassette recorded in the LP Mode on this Movie Camera is played back on other digital video equipment.
  - When a cassette recorded in the LP Mode on other digital video equipment is played back on this Movie Camera.
  - When a cassette recorded in the LP Mode on this Movie Camera is played back on digital video equipment not featuring the LP Mode.
  - In the Slow Motion or Still Advance Playback Mode. **(➔ 50, 52)**
  - When using the Camera Search Function. **(➔ 58)**
- As the recording track width in the LP Mode is smaller than the head width, recording new sound onto an already recorded cassette (audio dubbing) **(➔ 96)** is not possible.



Using the Finder

Before using the Finder, adjust it to your eyesight so that the indications in the Finder are clear and easy to read.

1 Set the [POWER] Switch to [CAMERA] or [VCR].
Turn the switch while pressing the button ❶.

2 Slide the Finder backward.

3 Adjust by sliding the Eyepiece Corrector Knob ❷.
It is also possible to adjust the brightness of the Finder with the item [LCD/EVF SET] on the [CAMERA MENU3] Menu or [VCR MENU2] Menu. (➔ 142)

Using the LCD Monitor

You can also record while viewing the picture on the opened LCD Monitor.

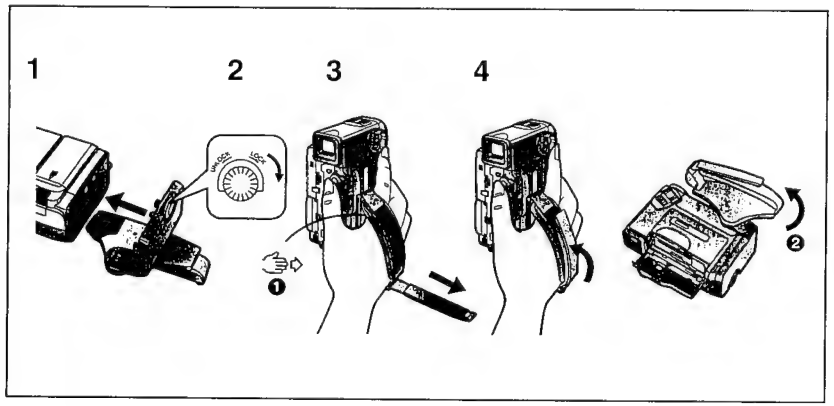
1 **Set the [POWER] Switch to [CAMERA] or [VCR].**
Turn the switch while pressing the button ❸.

2 **Open the LCD Monitor.**
The Finder turns off.

Adjusting the Angle

3 **Adjust the angle of the LCD Monitor according to the recording angle.**
- The LCD Monitor rotates upward a maximum of 180° ❹ and downward by a maximum of 90° ❺ from its normal vertical position. Trying to forcefully rotate it beyond this range could seriously damage the Movie Camera.
- It is also possible to adjust the colour saturation and brightness of the LCD Monitor with the item [LCD/EVF SET] on the [CAMERA MENU3] Menu or [VCR MENU2] Menu.(➔ 142)

Closing the LCD Monitor
After use, turn the LCD Monitor upright and close it securely.



Attaching the Hand Grip

The Hand Grip ensures reduced hand fatigue even during longer recording, and the integrated Grip Belt protects the Movie Camera against accidental falls.

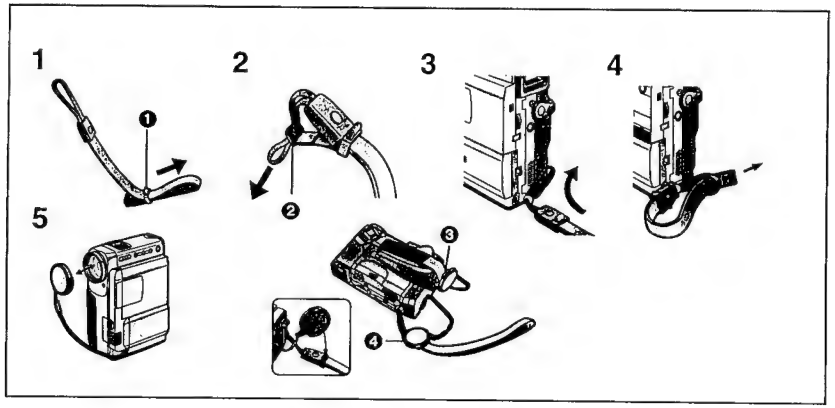
1 Place the Hand Grip on the side and bottom of the Movie Camera so that the Hand Grip's screw is aligned with the tripod receptacle.

2 Tighten the screw by turning it in the direction of [LOCK].

3 Pass your hand through the Grip Belt in the direction indicated by the mark ❶ and adjust its length.

4 Fold up the end of the Grip Belt to securely fasten the velcro tape closure.
Before attaching the Output Terminal Box [AV ONE TOUCH STATION] to the Movie Camera, detach the Hand Grip.

- When inserting and taking out the cassette, turn the Hand Grip as shown above ❷ so that it does not prevent the Upper Cassette Compartment Cover from opening.
- When using the Movie Camera, also loop the Hand Strap (➔ 30) around your wrist for added safety, before passing your hand under the Grip Belt.
- To carry the Movie Camera, do not hold it only by the Hand Grip.



Attaching the Hand Strap

Attaching the Hand Strap makes it convenient to carry the Movie Camera.

1 Pass the longer loop of the Hand Strap through the larger hole ❶ of the Lens Cap Holder.

2 Pass the shorter loop of the Hand Strap through the smaller hole ❷ of the Lens Cap Holder.

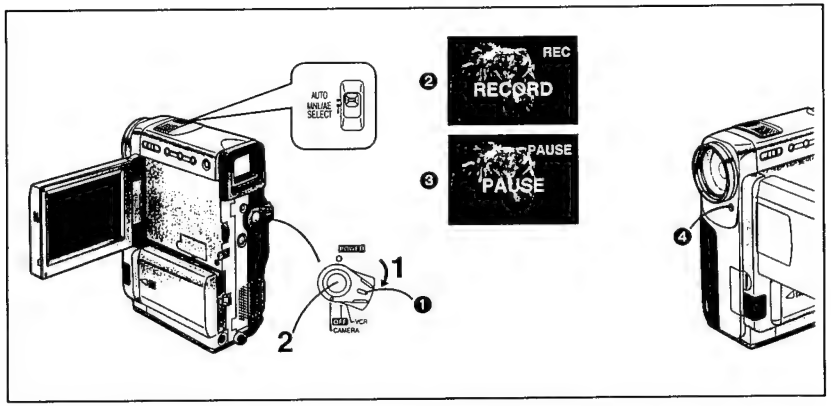
3 Pull the small loop at the end of the Hand Strap through the Hand Strap Holder.

4 Pass the big loop of the Hand Strap through the small loop.
When using the Hand Strap to carry the Movie Camera, loop the Hand strap around your wrist and be careful not to accidentally hit the Movie Camera against hard objects.

Handling the Lens Cap

Before you start recording, remove the Lens Cap.

5 Attach the removed Lens Cap either to the Lens Cap Holder on the Grip Belt ❸ or on the Hand Strap ❹.
When not actually recording, always attach the Lens Cap to the Lens to protect it.



Recording

After setting the [POWER] Switch to [CAMERA] and the Mode Selector Switch to [AUTO], you can simply press the Start/Stop Button to start recording. In this case, the Movie Camera adjusts the focus and white balance fully automatically.

- Depending on the light source and recording situation, correct automatic focusing and white balance adjustment may not be possible. In such cases, adjust them manually.
  Focus: (➔ 86); White Balance: (➔ 82, 84)

1 Set the [POWER] Switch to [CAMERA].
Turn the switch while pressing the button ❶.

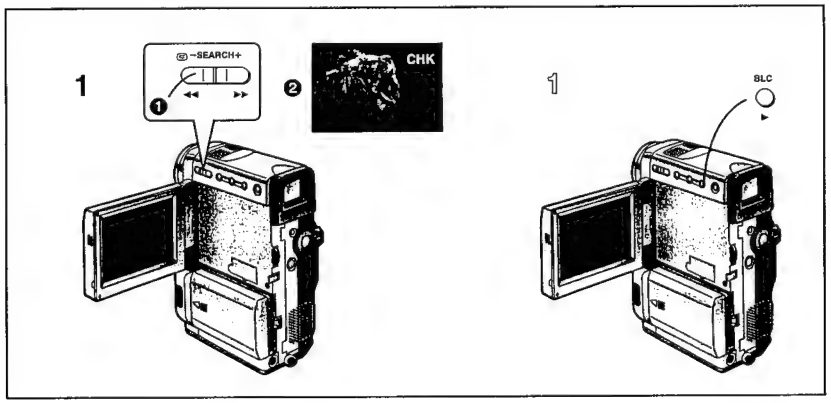
2 Press the Start/Stop Button.
Recording starts.
The [RECORD] Indication appears briefly and then changes to [REC] ❷.

To pause recording:
Press the Start/Stop Button again.
The [PAUSE] Indication appears. ❸

To finish recording:
Set the [POWER] Switch to [OFF].
Turn the switch while pressing the button ❶.

- **If you leave the Movie Camera in the Recording Pause Mode for more than 6 minutes, it automatically switches off to protect the tape and to conserve battery power. To resume recording from this condition, set the [POWER] Switch to [OFF] and then to [CAMERA] again.**

Recording Lamp (Tally Lamp)
The Recording Lamp lights ❹ during recording to let the people in front of the Movie Camera know that recording is being performed.
If you set [REC LAMP] on the [CAMERA MENU3] Menu to [OFF], the Recording Lamp does not light.



Checking If the Picture Is Recorded
(Recording Check)

To play back the final few seconds of the last recorded scene in the Recording Pause Mode.

1 Press the Recording Check Button [⟲] ❶ briefly in the Recording Pause Mode.

The [CHK] Indication ❷ appears.
After checking, the Movie Camera returns to the Recording Pause Mode.

- For Recording Check, the Movie Camera must be in the same mode (SP or LP) as used for recording, otherwise the playback picture is distorted.

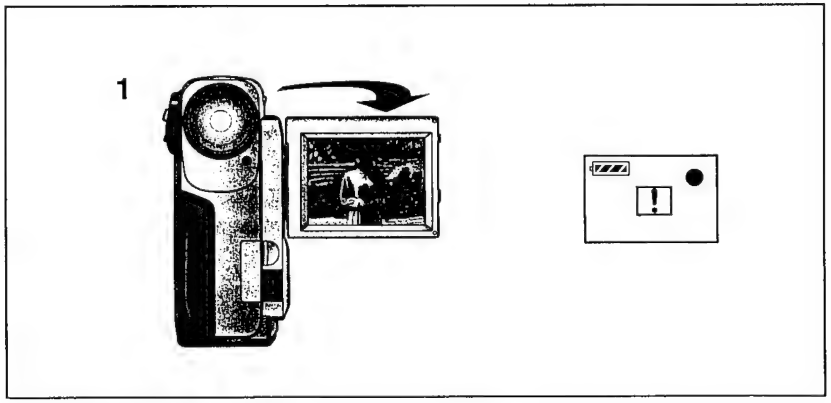
Recording Backlit Scenes
(Backlight Compensation)

To prevent the backlit subject from being recorded very dark.
(Backlight means that the light falls on the subject from behind, i.e. the subject is between the light source and the Movie Camera.)

1 Keep the Backlight Button [BLC] pressed.

The backlight is being compensated as long as you keep the Button pressed, and the subject is recorded more brightly. (The picture brightens up as a whole.)

Returning to Normal Recording
Release the Backlight Button [BLC].



Recording Yourself
(Recording with the LCD Monitor Facing Forward)

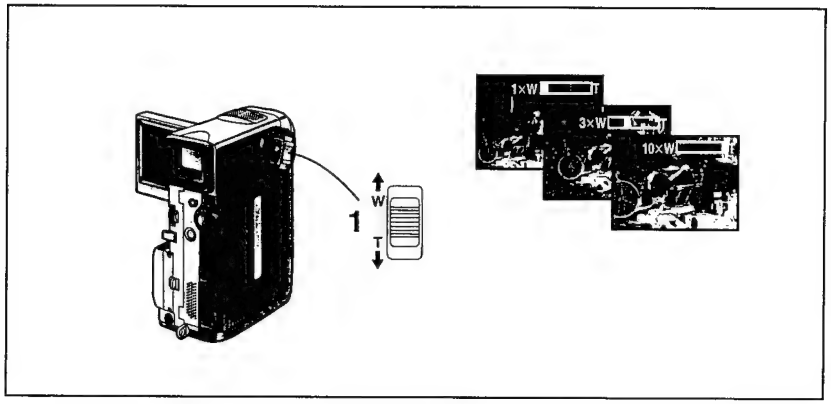
This makes it possible to record yourself while viewing the picture on the LCD Monitor or to show the persons in front of the Movie Camera the picture being recorded.

1 Open the LCD Monitor and turn it so that it faces forward (lens side).
Opening the LCD Monitor automatically turns off the Finder. However, when you turn the LCD Monitor forward, the picture also appears in the Finder.
This lets you aim the Movie Camera and view the picture in the Finder, while the persons in front of the Movie Camera can check the picture on the LCD Monitor during recording.

Mirror Mode
If you set [SELFSHOOT] on the [CAMERA MENU3] Menu to [MIRROR], the picture displayed on the LCD Monitor is reversed liked a mirror-image. When recording yourself with the LCD Monitor facing forward, the picture as it is being recorded might look unusual. We usually look at ourselves in the mirror and, although the image we see there is actually reversed right and left, it feels more natural because we are used to it. This Movie Camera features the Mirror Mode which displays the picture as a mirror-image.
However, even if you have selected the Mirror Mode, the picture is recorded in the normal way.

- In the Mirror Mode, only the following indications are displayed.
  ●: Recording
  ●II: Recording Pause
  ▭: Remaining Battery Power

When the General Warning/Alarm Indication [⚠] appears, turn the LCD Monitor backward so that you can confirm the actual Warning/Alarm Indication.



Recording with zoom function

(Zooming In/Out)

Recording close-ups of your subjects and recording wide-angle shots add special effects to your videos.

1 Slide the [W/T] Zoom Lever toward [T] to zoom in on a subject, and toward [W] to zoom out.

- The Zoom Magnification Indication appears for a few seconds.
- The farther you slide the [W/T] Zoom Lever toward [W] or [T], the faster the zooming speed becomes.
- During recording, the zooming speed is lower than during recording pause.

Enlarging Your Subjects Even More (Digital Zooming)

If you set [EFFECT1] on the [CAMERA MENU1] Menu to [& ZOOM] or [ZOOM], it is possible to further enlarge the subject.

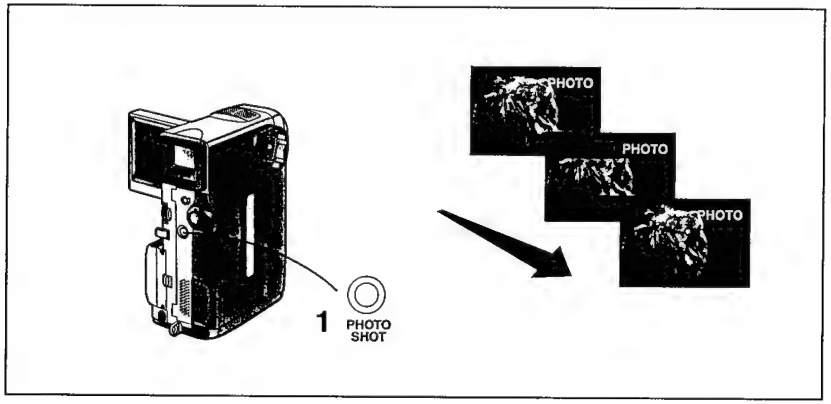
The [D.ZOOM] Indication appears.

- **20**×: Digital zooming up to 20×.
- **100**×: Digital zooming up to 100×.
- Up to 10×, the Zoom Magnification is done optically.
- The higher the Digital Zoom Magnification, the lower is the picture quality.
- For the item [D.ZOOM] on the [CAMERA MENU1] Menu, you can select either [20×] or [100×] as the maximum zoom magnification.
- The Digital Zoom Function only works when [EFFECT1] on the [CAMERA MENU1] Menu is set to [& ZOOM] or [ZOOM].

Recording Extra Close-up Shots of Small Subjects (Macro Close-up Function)

When the zoom magnification is 1×, the Movie Camera can focus on subjects down to a distance of approximately 35 mm between lens and subject. This allows recording very small subjects such as insects.

- When you have zoomed to the tele setting, precise focusing is only possible on subjects no closer than 1.2 metres.



Using the Movie Camera as a Digital Still Camera (Photoshot)

With this function, you can record still pictures with sound for approximately 7 seconds each.

This function is convenient for example for pictures that you want to print on a Video Printer.

1 Press the [PHOTO SHOT] Button. (This function can be used during recording, too.)

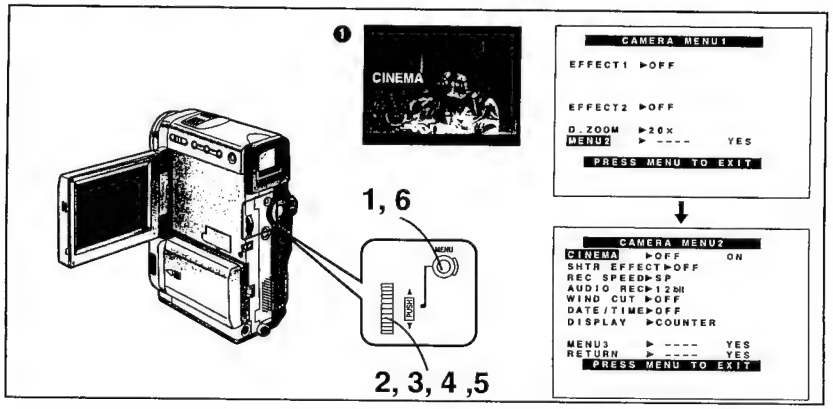
The Movie Camera records a still picture for approximately 7 seconds and then switches over to the Recording Pause Mode.

- If you set [SHTR EFFECT] on the [CAMERA MENU2] Menu to [ON], the screen blinks briefly and a simulated shutter click sound can be heard when you press the [PHOTO SHOT] Button. This audiovisual effect is also recorded.
- With the still pictures that you have recorded in the Photoshot Mode, you can do the following:
  - Index Search (➔ 62, 64)
    (However, searching for the picture(s) recorded at the beginning of the tape may not be possible.)
  - Automatic printing (➔ 122)
- The visual shutter effect and click sound may occur with slight delay after recording of the still picture has started.
- The picture quality deteriorates slightly.

Continuous Photoshot

If you set [SHTR EFFECT] on the [CAMERA MENU2] Menu to [ON] and keep the [PHOTO SHOT] Button pressed (either in the Recording Pause Mode or during recording), the Movie Camera automatically records still pictures successively at intervals of approximately 0.7 second until you release the button.

- One more still picture may be recorded after you release the [PHOTO SHOT] Button.
- As the still pictures recorded in the Continuous Photoshot Mode are not marked with photoshot index signals, they cannot be located by using the Photoshot Index Search Function and printed with the Auto Print Function.



Recording in the Cinema Mode

(Cinema Mode)

This mode lets you record in the cinema-like wide-screen format.

1 Press the [MENU] Button.
The [CAMERA MENU1] Menu appears.

2 Turn the [PUSH] Dial to select [MENU2].

3 Press the [PUSH] Dial to select [YES].
The [CAMERA MENU2] Menu appears.

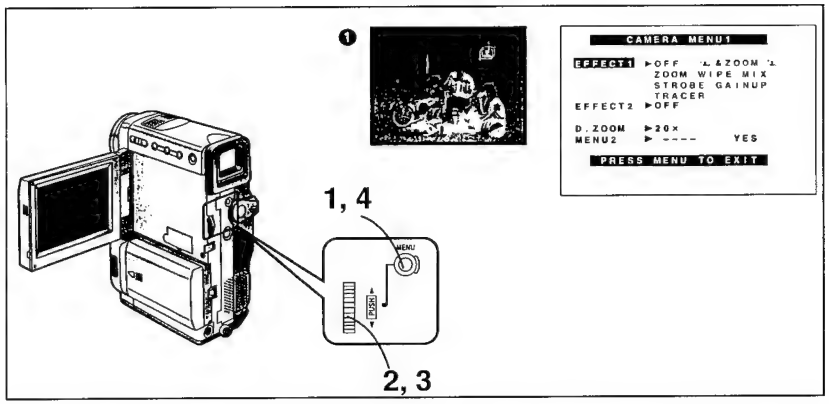
4 Turn the [PUSH] Dial to select [CINEMA].

5 Press the [PUSH] Dial to select [ON].
Black bars appear at the top and bottom on the screen. ❶

6 Press the [MENU] Button to exit the Menu.

Cancelling the Cinema Mode

Set [CINEMA] on the [CAMERA MENU2] Menu to [OFF].



Recording with Minimised Camera Shake (Super Image Stabilizer)

In recording situations where shaking of the Movie Camera is likely to happen, for example when you have zoomed in on a distant subject or when you record while walking, you can use this function to stabilize the image.

- In case of very strong camera shake, it may not be possible to stabilize the picture.

1 **Press the [MENU] Button.**
The [CAMERA MENU1] Menu appears.

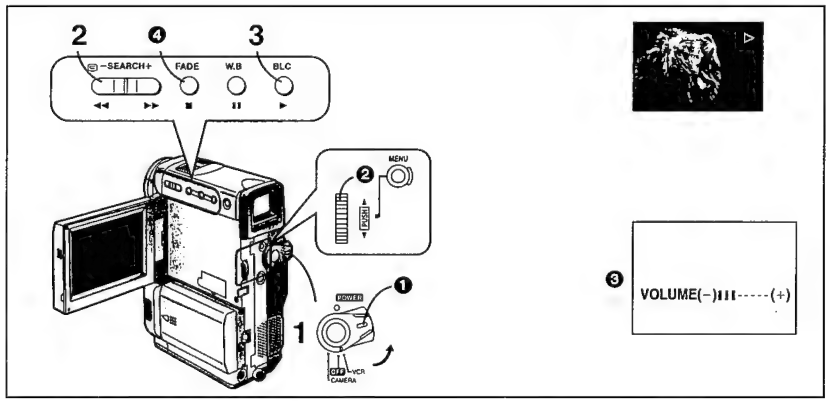
2 **Turn the [PUSH] Dial to select [EFFECT1].**

3 **Press the [PUSH] Dial to select [& ZOOM] or [ ].**

4 **Press the [MENU] Button to exit the Menu.**
The [ ] Indication ❶ appears.

- In a dimly lit place, the Super Image Stabilizer Function may not work. In this case, the [ ] Indication flashes.
- Under fluorescent lamps, the picture brightness may fluctuate and the colours may be unnatural.
- After-image distortion may occur.
- When you use a tripod, we recommend to turn the Super Image Stabilizer Function off.

Cancelling the Super Image Stabilizer Function
Set [EFFECT1] on the [CAMERA MENU1] Menu to [OFF].



Viewing the Just Recorded Scenes on the Movie Camera (Playback)

You can play back recorded scenes right after recording.

1 **Set the [POWER] Switch to [VCR].**
- Turn the switch while pressing the button ❶.

2 **Press the Rewind Button [◀◀] to rewind the tape.**
- Rewind the tape to the point where the recording started.
- If the tape reaches the beginning, rewinding automatically stops.

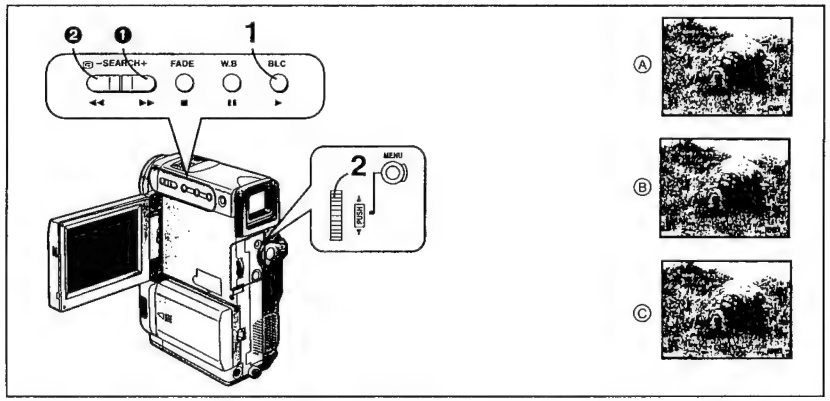
3 **Press the Play Button [▶] to start playback.**

To stop playback:
Press the Stop Button [■] ❹.
- If a cassette recorded with copyright protection signal is played back, the screen becomes black.

■ Adjusting the Sound Volume
Keep the [PUSH] Dial ❷ pressed until the [VOLUME] Indication ❸ appears. Then, turn the [PUSH] Dial to adjust the volume. After adjusting, press the [PUSH] Dial to make the [VOLUME] Indication disappear.
To adjust the volume with the Remote Controller, press the [T] or [W] Button to make the [VOLUME] Indication appear. You can then increase the volume by pressing the [T] Button or decrease it by pressing the [W] Button. A few seconds after finishing the adjustment, the [VOLUME] Indication disappears.

■ Repeat Playback
- If you keep the Playback Button [▶] pressed for more than 5 seconds, the Movie Camera switches over to the Repeat Playback Mode and the [R ▷] Indication appears. To cancel the Repeat Playback Mode, set the [POWER] Switch to [OFF].

Making the Date/Time Indication Appear
This Movie Camera automatically records the date and time, however not directly in the picture but as part of the sub code (➔ 158).
To make the Date/Time Indication appear, set [DATE/TIME] on the [VCR MENU1] Menu to the desired setting.



Searching for a Scene That You Want to Play Back

Cue Playback Ⓐ
Keep the Cue Button [▶▶] ❶ pressed during playback.

Review Playback Ⓑ
Keep the Review Button [◀◀] ❷ pressed during playback.

Search Lock Function
For longer Cue or Review Playback, press the Cue Button [▶▶] or the Review Button [◀◀] only briefly. As this locks the search function, you do not need to keep the button pressed for a long time.

- To resume normal playback, press the Play Button [▶].
- In Cue and Review Playback, pictures with fast-moving subjects may contain mosaic-like patterns.

Hyper Check Function
- If you press the Fast-forward Button [▶▶] during fast-forwarding of the tape or the Rewind Button [◀◀] during rewinding of the tape, Cue Playback or Review Playback continues for as long as you keep the Button pressed.
- At the beginning and end of Cue Playback or Review Playback, some momentary picture distortion may occur.

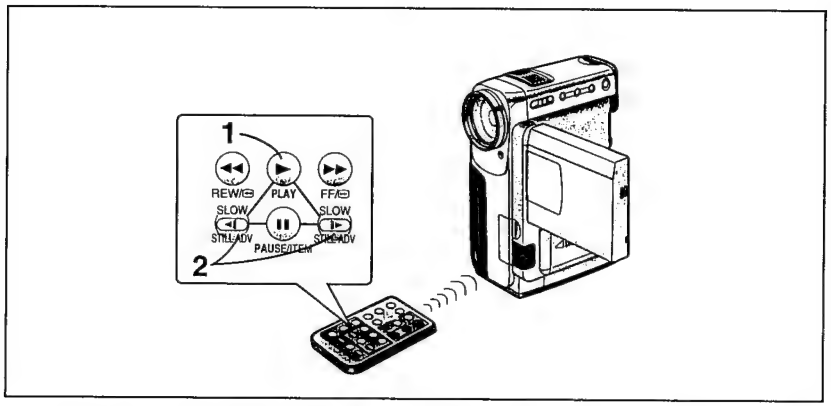
Variable Speed Search Function Ⓒ
It is possible to change the speed of Cue Playback or Review Playback.

1 **Press the Play Button [▶] during playback.**

2 **Turn the [PUSH] Dial to select the desired search speed.**

The Variable Speed Search function offers a choice of five playback speeds (1×, 2×, 5×, 10×, 20×) both in forward direction and reverse direction.

Returning to Normal Playback
Press the Play Button [▶]. Playback continues at normal speed.
- During Variable Speed Search (except at 1× speed in forward direction), mosaic-like patterns appear in the picture.
- When using the Variable Speed Search Function, the sound is muted.



Playing Back in Slow Motion
(Slow Motion Playback)

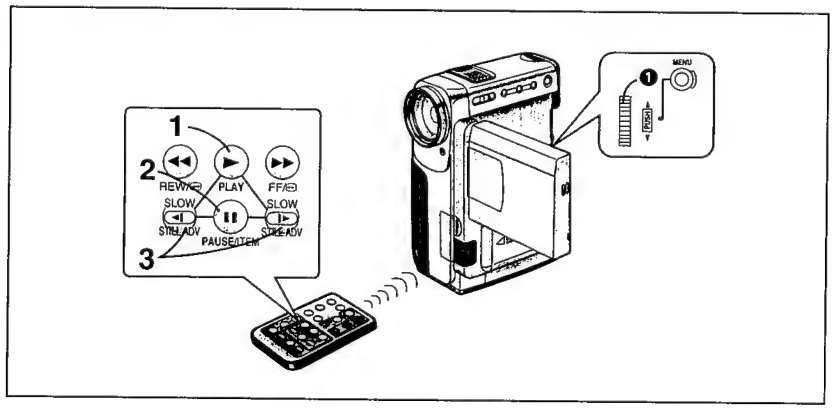
1 **Press the Play Button [▶].**

2 **Press the Slow Motion/Still Advance Button [◂I] or [I▸] on the Remote Controller.**
Pressing the [◂I] Button starts slow motion playback in reverse direction, and pressing the [I▸] Button starts slow motion playback in forward direction.

Scenes recorded in the SP Mode are played back at approximately 1/5th of the normal speed.
Scenes recorded in the LP Mode are played back at approximately 1/3rd of the normal speed.

- During slow motion playback in reverse direction, the Time Code Indication may not be accurate.

Resuming Normal Playback
Press the Play Button [▶].
Playback continues with normal speed.



Playing Back Still Pictures and Advancing Them One by One
(Still Playback/Still Advance Playback)

You can freeze the action during playback and advance the still pictures one by one.

1 **Press the Play Button [▶].**

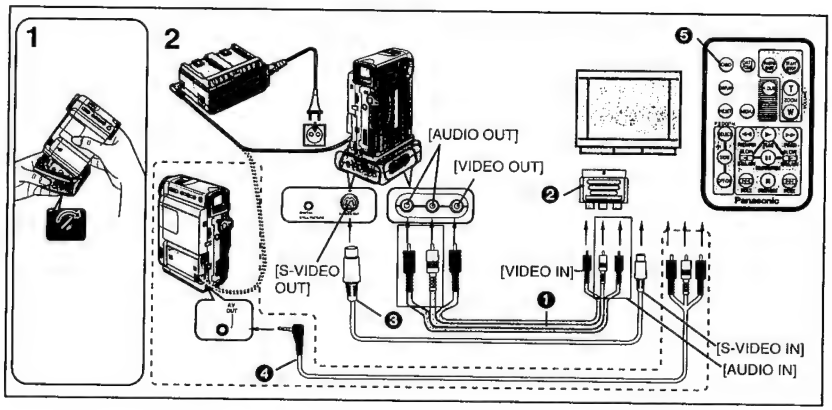
2 **Press the Pause Button [❚❚].**
The playback picture stops in the Still Playback Mode.

3 **Press the Slow Motion/Still Advance Button [◂I] or [I▸] on the Remote Controller.**
Pressing the [◂I] Button advances the still picture frame by frame in reverse direction. Pressing the [I▸] Button advances the still picture frame by frame in forward direction.

- Each press of the [◂I] Button advances to the next still picture in reverse direction. Each press of the [I▸] Button advances to the next still picture in forward direction. Keeping either button pressed continuously advances the still picture frame by frame until you release the button.
- If you leave the Movie Camera in the Still Playback Mode for more than 6 minutes, it switches over to the Stop Mode to protect the video heads against excessive wear.
- During Still Advance Playback, the Time Code Indication may not be accurate.

Resuming Normal Playback
Press the Play Button [▶].
Playback continues with normal speed.

Using the Jog Dial (Jog Playback)
By turning the Jog Dial ([PUSH] Dial) ❶ on the Movie Camera in the Still Playback Mode, you can advance the still pictures one by one in forward or reverse direction.



Playing Back on a TV
(With the Output Terminal Box [AV ONE TOUCH STATION] Attached)

Attaching the Output Terminal Box [AV ONE TOUCH STATION] to the Movie Camera makes it possible to play back recorded scenes on a TV.

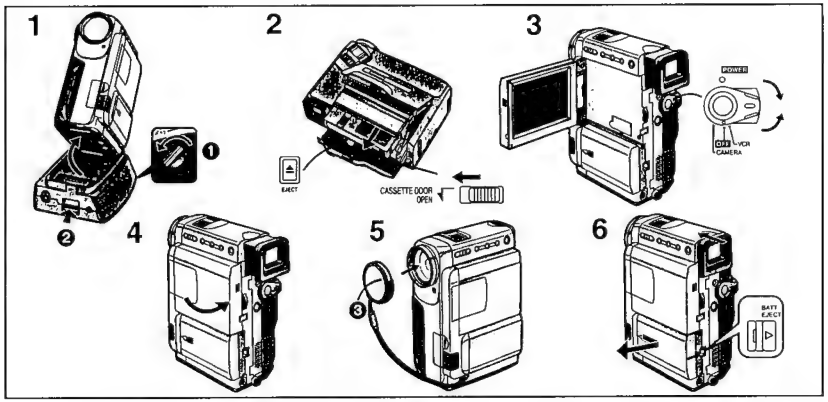
1 **Attach the Output Terminal Box [AV ONE TOUCH STATION]. (→ 112)**

2 **Connect the Video and Audio output Socket on the Output Terminal Box [AV ONE TOUCH STATION] with the Scart Input Socket (or separate Video and Audio Input Sockets) on the TV.**
Use the AV Cable (PHONO-PHONO) ❶ and 21-pin Adaptor ❷ to connect to the TV. If your TV is equipped with an S-Video Socket, also connect the S-Video Cable ❸.

Easy Playback on a TV
Instead of connecting the Movie Camera to the TV through the Output Terminal Box [AV ONE TOUCH STATION], as described in step 2 above, you can use the AV Cable (PHONO-M3) ❹ to connect [AV OUT] on the Movie Camera directly to the Video and Audio Input Sockets on the TV.

- Before connecting, turn off both the Movie Camera and the TV.
- If a cassette recorded with copyright protection signal is played back, the screen becomes black. However, scenes recorded with this Movie Camera do not contain a copyright protection signal.

Making the Indications Appear on the TV Screen
Press the [OSD] Button ❺ on the Remote Controller. The On-Screen Indications also appear on the TV screen.



After Use

1 **Loosen the locking screw ❶ and remove the Output Terminal Box [AV ONE TOUCH STATION] while pressing the [PUSH RELEASE] Button ❷.**
Hold both the Movie Camera and the Output Terminal Box firmly to prevent them from dropping.

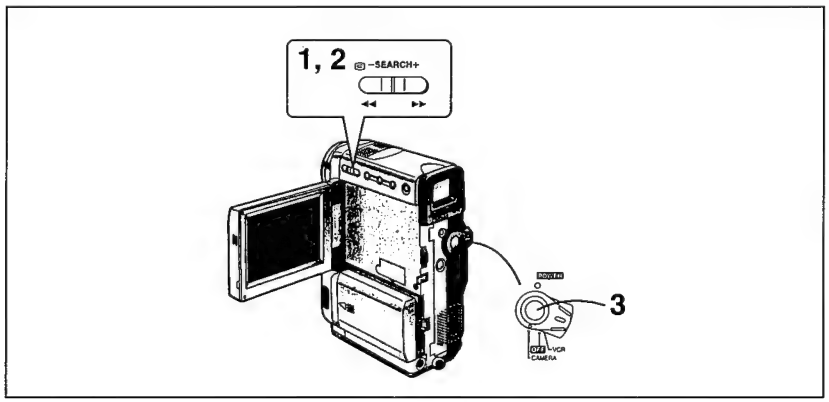
2 **Take out the cassette.**

3 **Set the [POWER] Switch to [OFF].**

4 **Close the LCD Monitor.**

5 **Attaching the Lens Cap**
After use, attach the supplied Lens Cap ❸ to the Lens to protect it.

6 **Remove the Battery and retract the Finder.** (→ 18)



Viewing Recorded Scenes During Recording Pause (Camera Search)

You can view recorded scenes when the Movie Camera is in the Recording Pause Mode.
The Camera Search Function is convenient to search for a scene from which you want to start recording a new scene with smooth scene-to-scene transition.

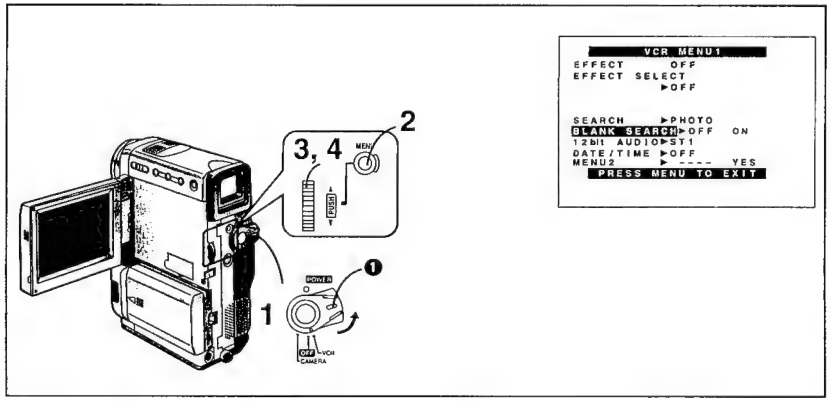
1 **Keep the Reverse Search Button [–SEARCH] or the Forward Search Button [SEARCH+] pressed for more than 1 second.**
Pressing the [–SEARCH] Button plays back the picture in reverse direction.
Pressing the [SEARCH+] Button plays back the picture in forward direction.

Starting to Record from the Desired Position

2 **Release the pressed Search Button.**
The Movie Camera is in the Recording Pause Mode.

3 **Press the Start/Stop Button to start recording.**
The Movie Camera starts recording a new scene with smooth scene-to-scene transition.

- In the Camera Search Mode, the picture may contain mosaic-like patterns. However, this is a phenomenon particular to digital video and completely normal.
- If the Recording Speed Modes (SP/LP) of the previous and the new recording are different, the playback picture may be distorted.



Searching for the End of the Recorded Part on a Cassette
(Blank Search)

With the Blank Search Function, you can quickly locate the end of the recorded part on a cassette (or a blank part between recordings).

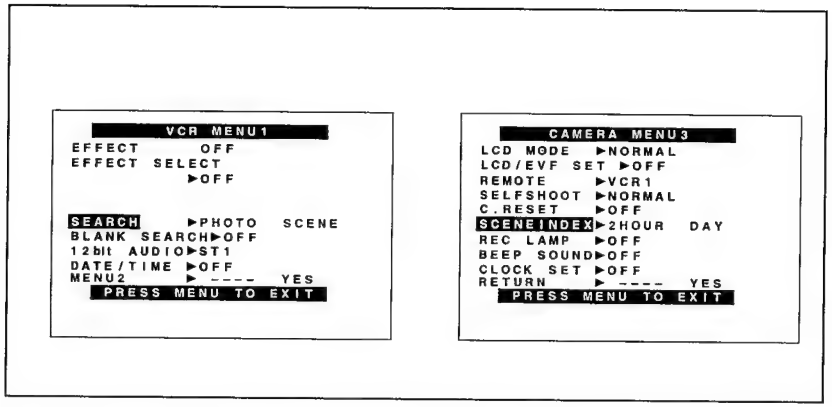
1 **Set the [POWER] Switch to [VCR].**
Turn the switch while pressing the button ❶.

2 **Press the [MENU] Button.**
The [VCR MENU1] Menu appears.

3 **Turn the [PUSH] Dial to select [BLANK SEARCH].**

4 **Press the [PUSH] Dial to select [ON].**
Approximately 1 second before the end of the last recorded scene, the Movie Camera switches over to the Still Playback Mode.

- If there is no blank part on a cassette, the Movie Camera stops at the end of the tape.
- If you set the [POWER] Switch to [CAMERA] and then start recording after the Blank Search has finished, the new scene will be joined to the end of the last recorded scene with a smooth transition.



Searching for the Beginning of Recorded Scenes Marked with Index Signal

(Index Search)

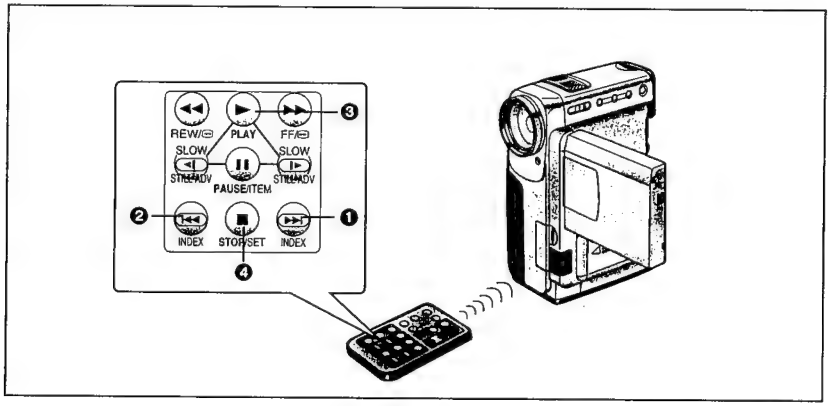
To allow easy searching for desired scenes, this Movie Camera automatically records index signals during recording as follows:

❶ Photoshot Index Signal
To search for still pictures recorded in the Photoshot Mode (➔ 40) and to use for automatic printing (➔ 122).
A photoshot index signal is automatically recorded every time you record a still picture in the Photoshot Mode.
- However, in the Continuous Photoshot Mode (➔ 40), no photoshot index signals are recorded.

❷ Scene Index Signal
To search for the beginning of recorded scenes.
A scene index signal is automatically recorded in the following cases:
- When you start recording after inserting a cassette.
- According to the setting of [SCENEINDEX] on the [CAMERA MENU3] Menu:

[2HOUR]: An index signal is recorded when recording is restarted after a lapse of more than 2 hours.
[DAY]: An index signal is recorded when recording is restarted after the date has changed since the last recording.

- While an index signal is being recorded, the [INDEX] Indication flashes for a few seconds.



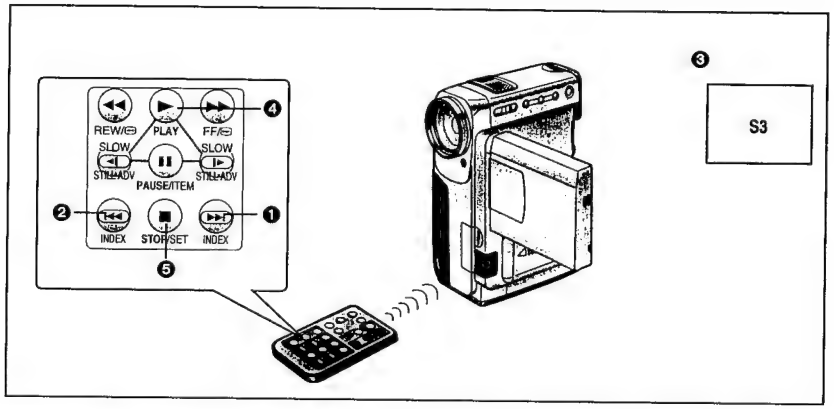
Searching for Photoshot Pictures (Photoshot Index Search)

- Set the [POWER] Switch to [VCR].
- Set [SEARCH] on the [VCR MENU1] Menu to [PHOTO].
(The initial setting is [PHOTO].)

Photoshot Index Search in Forward Direction
Press the Index Button [▶▶I] ❶ on the Remote Controller.

Photoshot Index Search in Reverse Direction
Press the Index Button [I◀◀] ❷ on the Remote Controller.

- At every press of the corresponding button, the tape is fast-forwarded or rewound to the next still picture recorded in the Photoshot Mode.
After reaching the next still picture, the still picture is played back continually, however the sound only for approximately 4 seconds. (If you leave the Movie Camera in the Still Playback Mode for more than 6 minutes, it switches over to the Stop Mode to protect the video heads against excessive wear.)
- The Photoshot Index Search may not work correctly for still pictures recorded near the beginning of the tape.
- As no photoshot index signals are recorded for still pictures recorded in the Continuous Photoshot Mode (➔ 40), the Photoshot Index Search Function cannot be used to search for these still pictures.
- If you keep the [I◀◀] or [▶▶I] Button pressed for more than 2 seconds, the Intro Search Function is activated and it plays back all still pictures recorded in the Photoshot Mode on the cassette one after another for a few seconds each.
(To cancel the Intro Search Function, press the Play Button [▶] ❸ or the Stop Button [■] ❹.)



Searching for the Beginning of Recorded Scenes (Scene Index Search)

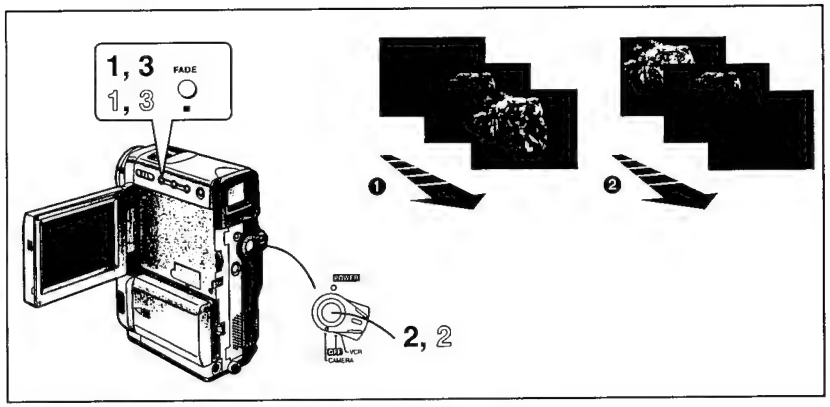
- Set the [POWER] Switch to [VCR].
- Set [SEARCH] on the [VCR MENU1] Menu to [SCENE].

Scene Index Search in Forward Direction
Press the Index Button [▶▶I] ❶ on the Remote Controller.

Scene Index Search in Reverse Direction
Press the Index Button [I◀◀] ❷ on the Remote Controller.

- When you briefly press the corresponding button once, the [S1] Indication appears and the search for the next scene marked with an index signal starts. After the Scene Index Search has started, every time you press the button, the indication changes successively from [S2] to [S9], and the beginning of the scene corresponding to the selected number is located. ❸ After reaching the desired scene, playback starts automatically. (At a time, Scene Index Search in forward or reverse direction is possible up to the ninth scene marked with index signal from the present tape position.)

- If the interval between two scene index signals is less than 1 minute, the Scene Index Search may not work correctly.
- The Scene Index Search may not work correctly for scenes recorded near the beginning of the tape.
- If you keep the [I◀◀] or [▶▶I] Button pressed for more than 2 seconds, the Intro Search Function is activated and it plays back the beginning of all scenes marked with an index signal on the cassette one after another for a few seconds each.
(To cancel the Intro Search Function, press the Play Button [▶] ❹ or the Stop Button [■] ❺.)



Fading In/Out

Fading In ❶
Fading-in lets you make the picture and sound appear gradually from a black screen at the beginning of a scene.

1 **With the Movie Camera in the Recording Pause Mode, keep the Fade Button [FADE] pressed.**
The picture gradually disappears.

2 **When the picture has completely disappeared, press the Start/Stop Button to start recording.**

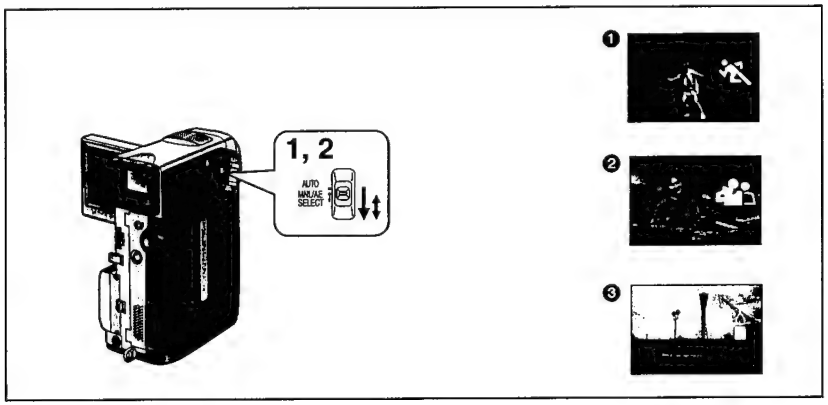
3 **Approximately 3 seconds after the recording has started, release the Fade Button [FADE].**
The picture gradually appears again.

Fading out ❷
Fading-out lets you make the picture and sound disappear gradually into a black screen at the end of a scene.

1 **During recording, keep the Fade Button [FADE] pressed.**
The picture gradually disappears.

2 **After the picture has completely disappeared, press the Start/Stop Button to stop recording.**
The Movie Camera is in the Recording Pause Mode.

3 **Release the Fade Button [FADE].**



Recording in Special Situations
(Programme AE)

This function lets you select Automatic Exposure settings optimized for special recording situations.

1 **Set the Mode Selector Switch to [MNL].**
The [MNL] Indication appears.

2 **Slide the Mode Selector Switch downward repeatedly until the indication of the desired mode ([ ], [ ] or [ ]) appears.**

[ ] Sports Mode ❶
To record scenes with fast-moving subjects such as sports scenes.

[ ] Portrait Mode ❷
To make subjects stand out sharply from the background.

[ ] Low Light Mode ❸
To record dark scenes more brightly.

Cancelling the Programme AE Function
Set the Mode Selector Switch to [AUTO].

Sports Mode

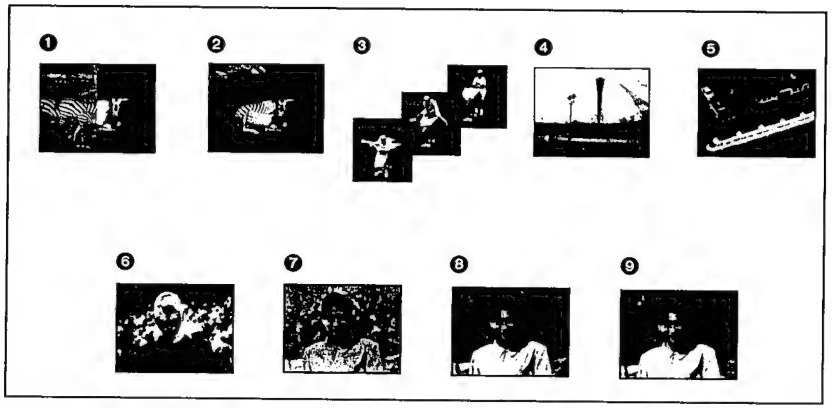
- When playing back scenes recorded in the Sports Mode, you can enjoy slow motion and still playback of very sharp images with fine details.
- Avoid recording under fluorescent, mercury-vapour or natrium lamps in this mode, as the colour and the brightness of the playback picture might fluctuate.
- When recording subjects lit by strong lights or with much light reflection, the playback picture may contain vertical streaks of light.
- When the scene is not sufficiently lit, the [ ] Indication flashes.
- When using this mode for recording indoors, the playback picture may flicker.
- It is not possible to use the Sports Mode [ ] together with the Gain-up Mode [GAINUP].

Portrait Mode

- When using this mode for recording indoors, the playback picture may flicker.
- It is not possible to use the Portrait Mode [ ] together with the Gain-up Mode [GAINUP].

Low Light Mode

- It may not be possible to sufficiently brighten up extremely dark scenes.



Recording with Special Effects
(Digital Effects)

There are 9 different modes available for adding special digital picture effects.

Digital Effects 1 [EFFECT1]

❶ Wipe Mode [WIPE]
It gradually replaces a picture of the last previously recorded scene with the picture of the new scene, like drawing a curtain. For details, (➔ 78).

❷ Mix Mode [MIX]
It gradually fades out the picture of the last previously recorded scene while fading in the picture of the new scene. For details, (➔ 80).

❸ Strobe Mode [STROBE]
It records the pictures with a stroboscope-like effect.

❹ Gain-up Mode [GAIN UP]
It electronically brightens up the picture.
In this mode, adjust the focus manually.

❺ Trailing Effect Mode [TRACER]
The picture is recorded with a trailing effect.
If you record in the Continuous Photoshot Mode (➔ 40), only the first still picture has this effect.

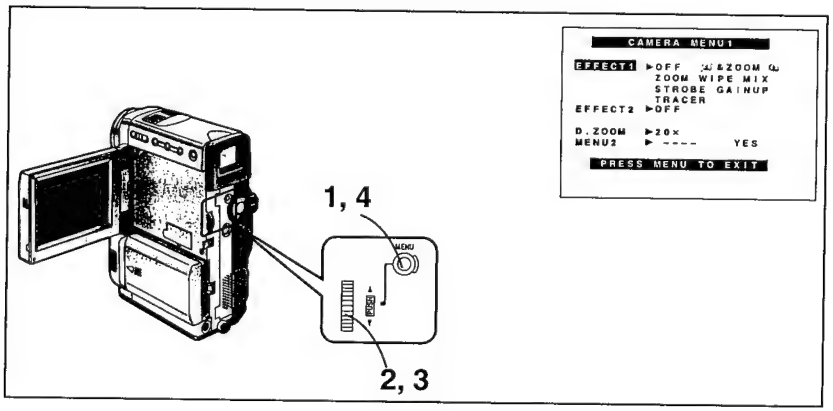
Digital Effects 2 [EFFECT2]

❻ Negative/Positive Mode [NEGA]
The recorded pictures have reversed colours similar to photographic negatives.

❼ Sepia Mode [SEPIA]
Scenes are recorded with a brown tint similar to the colour of old photographs.

❽ Black & White Mode [B/W]
The picture is recorded in black and white.

❾ Solarisation Mode [SOLARI]
The picture is recorded with an effect similar to a painting.



Recording with Special Effects
(Digital Effects) (Continued)

Selecting the Desired Digital Effect

1 Press the [MENU] Button.
The [CAMERA MENU1] Menu appears.

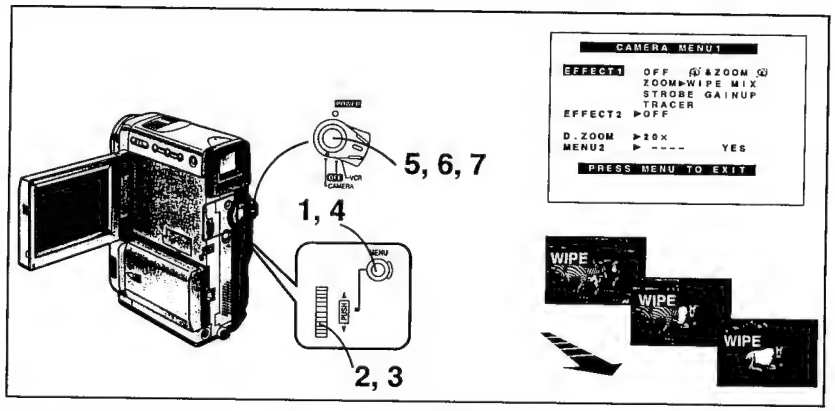
2 Turn the [PUSH] Dial to select [EFFECT1] or [EFFECT2].

3 Press the [PUSH] Dial to select the desired digital effect.

4 Press the [MENU] Button to exit the Menu.
- The picture now has the selected digital effect. However, the effect of the Wipe Function and the Mix Function only become visible when actually recording in the respective mode. (➔ 78, 80)

- If you have set [EFFECT1] on the [CAMERA MENU1] Menu to [GAINUP], you need to adjust the focus manually; however, adjusting the shutter speed and selecting a white balance mode are not possible.
- If you have set [EFFECT2] on the [CAMERA MENU1] Menu to [B/W] or [SEPIA], changing the selected white balance mode is not possible.
- It is not possible to use the Sports Mode [ ] or the Portrait Mode [ ] together with the Gain-up Mode [GAINUP].

Cancelling the Digital Effect
Set [EFFECT1] or [EFFECT2] on the [CAMERA MENU1] Menu to [OFF].



Recording with Special Effects
(Digital Effects) (Continued)

■ Wipe Mode
It gradually replaces a still picture of the last recorded scene with the moving picture of the new scene, like drawing a curtain.

1 Press the [MENU] Button.
The [CAMERA MENU1] Menu appears.

2 Turn the [PUSH] Dial to select [EFFECT1].

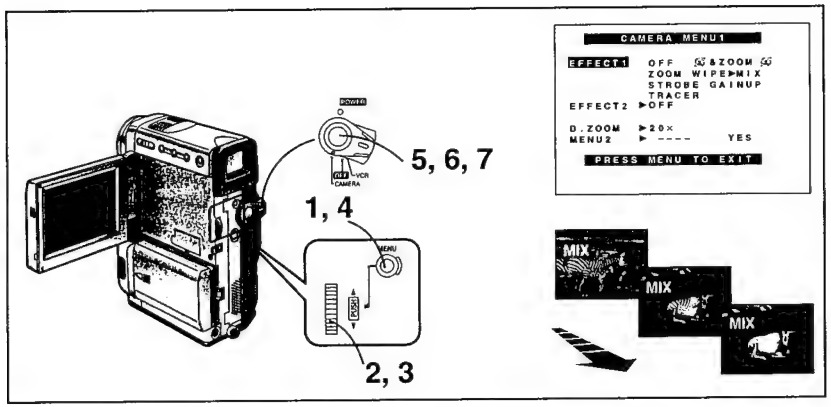
3 Press the [PUSH] Dial to select [WIPE].

4 Press the [MENU] Button to exit the Menu.
The [WIPE] Indication appears.

5 Press the Start/Stop Button to start recording.
The normal recording starts.

6 Press the Start/Stop Button to pause recording.
The last picture is stored in memory.
The [WIPE] Indication changes to [WIPE].

7 Press the Start/Stop Button to start recording again.
The last picture of the previous scene is gradually replaced by the new scene.



Recording with Special Effects
(Digital Effects) (Continued)

■ **Mix Mode**
It gradually fades out a still picture of the last recorded scene while fading in the moving picture of the new scene.

1 **Press the [MENU] Button.**
The [CAMERA MENU1] Menu appears.

2 **Turn the [PUSH] Dial to select [EFFECT1].**

3 **Press the [PUSH] Dial to select [MIX].**

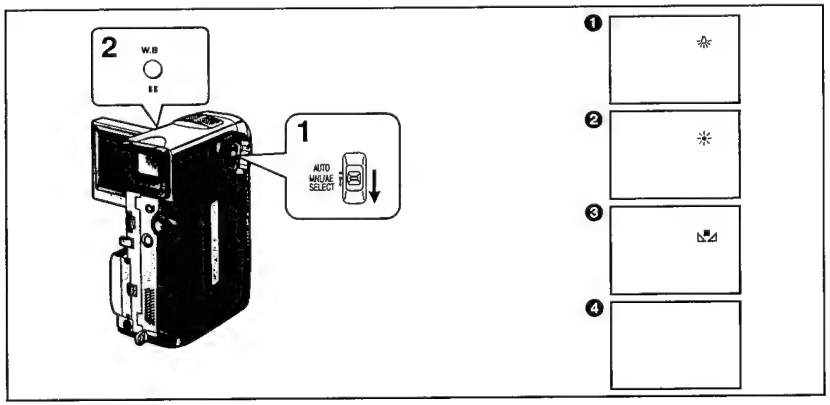
4 **Press the [MENU] Button to exit the Menu.**
The [MIX] Indication appears.

5 **Press the Start/Stop Button to start recording.**
The normal recording starts.

6 **Press the Start/Stop Button to pause recording.**
The last picture is stored in memory.
The [MIX] Indication changes to [MIX].

7 **Press the Start/Stop Button to start recording again.**
The last picture gradually fades out while the new scene fades in.

-80-



Recording with Natural Colours
(White Balance)

This Movie Camera automatically adjusts the white balance to ensure that the pictures are recorded with natural colours. For certain types of subjects and lighting conditions, however, this Auto White Balance Adjustment Mode may not be able to ensure natural colours **(➔ 164, 166)**. In these cases, you can select either one of the 3 preset modes explained below (indoor, outdoor, or the last manually adjusted white balance setting), or you can manually adjust the white balance **(➔ 84)**.

1 **Set the Mode Selector Switch to [MNL].**
The [MNL] Indication appears.

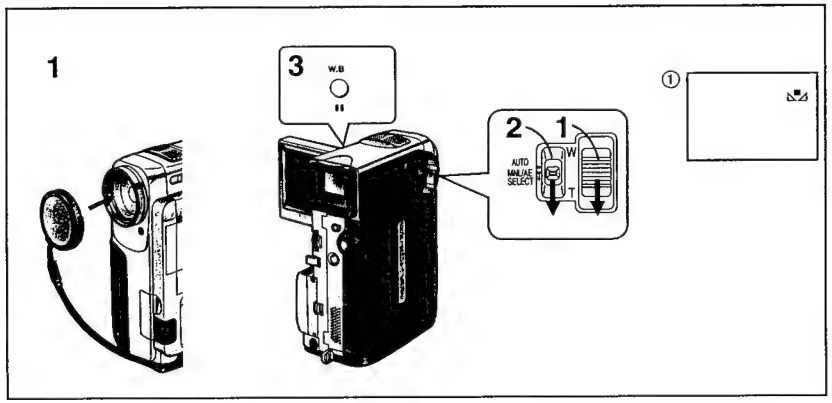
2 **Press the White Balance [W.B] Button.**
Repeatedly press the [W.B] Button to select the desired White Balance Mode.

The modes change in the following order:
❶ Indoor Mode
(recording under incandescent lamp) (☼)
❷ Outdoor Mode (☀)
❸ Last manually adjusted White Balance setting (▭) **(➔ 84)**
❹ Automatic White Balance Adjustment
(no indication)

- If you have set [EFFECT1] on the [CAMERA MENU1] Menu to [GAINUP] or you have set [EFFECT2] to [SEPIA] or [B/W], it is not possible to change the white balance mode.
- To change the white balance mode, the Movie Camera must be set within the optical zoom range (1× – 10×). If you try to change it in the digital zoom range, the [▭] Indication flashes.

Returning to the Auto White Balance Adjustment Mode
Press the [W.B] Button repeatedly until none of the White Balance Mode Indications ([☼], [☀], [▭]) are displayed any more. Or, set the Mode Selector Switch to [AUTO].

-82-



Adjusting the White Balance Manually

Use the Manual White Balance Adjustment Mode for all types of lighting outside the range ❶ **(➔ 166)**, as the Auto White Balance Adjustment Mode can only ensure natural colours for the types of lighting within that range. For optimum results under almost any type of lighting, we recommend that you adjust the white balance manually for each new scene.

1 **Attach the Lens Cap and zoom in until the entire screen becomes white.**

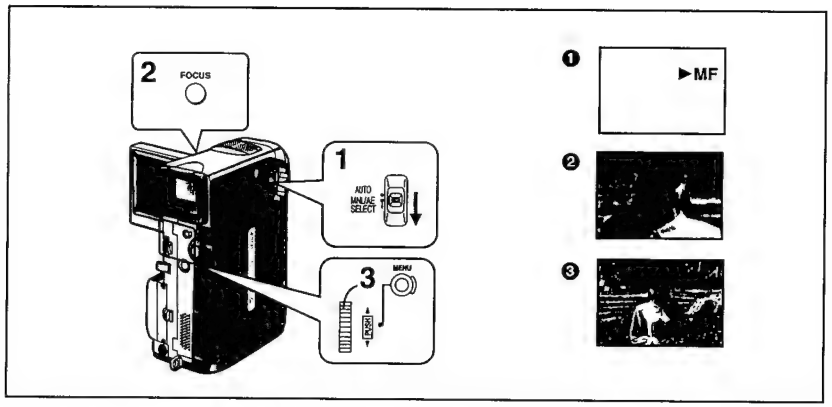
2 **Set the Mode Selector Switch to [MNL].**
The [MNL] Indication appears.

3 **Keep the [W.B] Button pressed until the [▭] Indication ① stops flashing and remains lit.**

- The Manual White Balance Adjustment is now finished. If you want to use this setting again later on, for example after having used Automatic White Balance Adjustment, you can recall it by pressing the [W.B] Button 3 times. (In this case, the [▭] Indication flashes.)
- When the [▭] Indication remains flashing under weak illumination, the Manual White Balance Adjustment cannot be set manually.
- If you have set [EFFECT1] on the [CAMERA MENU1] Menu to [GAINUP], or you have set [EFFECT2] to [SEPIA] or [B/W], it is not possible to adjust the white balance.
- Adjusting the white balance is only possible when the Movie Camera is set within the optical zoom range (1× – 10×). If you try to adjust it in the digital zoom range, the [▭] Indication flashes.

Returning to the Auto White Balance Adjustment Mode
Press the [W.B] Button repeatedly until none of the White Balance Mode Indications ([☼], [☀], [▭]) are displayed any more. Or, set the Mode Selector Switch to [AUTO].

-84-



Focusing on the Subject Manually
(Manual Focus)

This makes it possible to adjust the focus manually for subjects and recording situations for which automatic focusing is not precise.

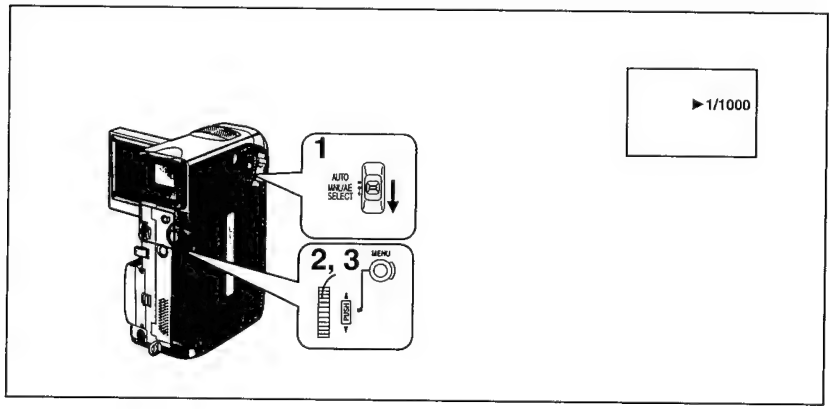
1 **Set the Mode Selector to [MNL].**
The [MNL] Indication appers.

2 **Press the [FOCUS] Button.**
The [►MF] Indication ❶ appears.
MF; Manual Focus Mode

3 **Turn the [PUSH] Dial until the subject is sharp.**

Returning to the Automatic Focusing Mode
Press the [FOCUS] Button to make the [►MF] Indication disappear. Or, set the Mode Selector Switch to [AUTO].

Hint for Manual Focus Adjustment
- If you adjust the focus in the wide-angle setting, the subject may go out of focus when you enlarge it. Therefore, enlarge the subject ❷ before you adjust the focus, so that the picture remains focused when you zoom out ❸.
- If you want to adjust the focus manually after having adjusted the shutter speed **(→ 88)** or the iris **(→ 90)**, be sure to press the [FOCUS] Button to make the [►MF] Indication appear, even if the [MF] Indication is displayed.



Adjusting the Shutter Speed Manually

To achieve special creative effects or to cope with special lighting situations or fast-action scenes, you can adjust the shutter manually.

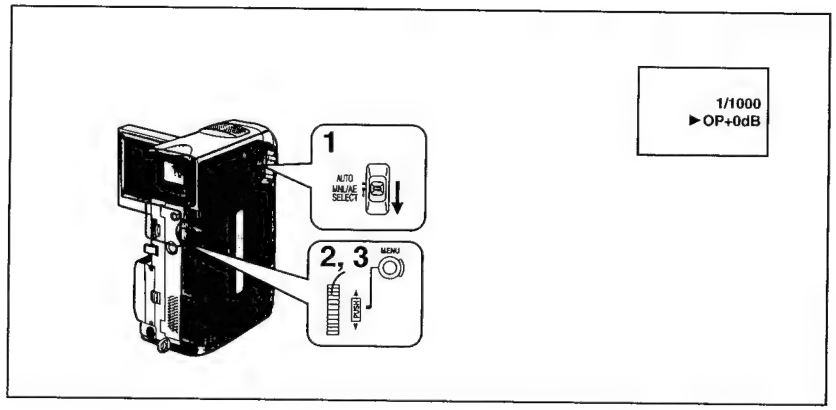
1 **Set the Mode Selector Switch to [MNL].**
The [MNL] Indication appears.

2 **Press the [PUSH] Dial.**
The Shutter Speed Indication appears.
You can change between the Shutter Speed Indication and the Iris (F Number) **(→ 90)** Indication by repeatedly pressing the [PUSH] Dial.

3 **Turn the [PUSH] Dial to adjust the shutter speed.**

Range of Shutter Speed Adjustment
1/50–1/8000 s
The standard shutter speed is 1/50 s.
The nearer to [1/8000] a setting you select, the faster the shutter speed becomes.

Returning to the Normal Shutter Speed
Set the Mode Selector Switch to [AUTO].



Adjusting the Iris (F Number) Manually

To achieve special creative effects or to cope with special lighting situations, you can adjust the iris (F number) manually.

1 **Set the Mode Selector Switch to [MNL].**
The [MNL] Indication appears.

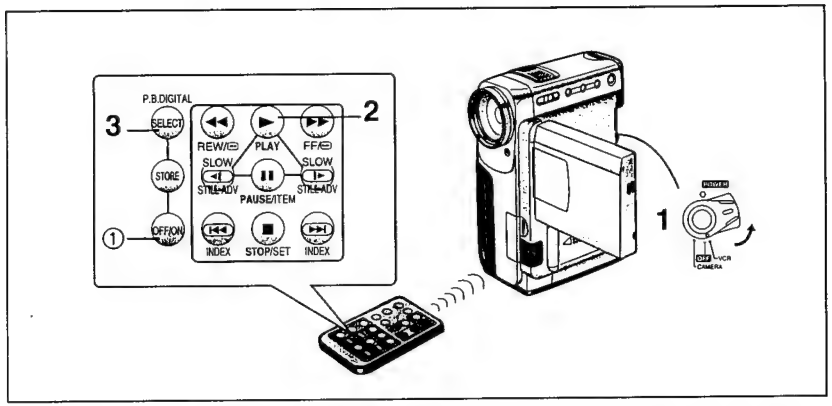
2 **Press the [PUSH] Dial twice.**
The [►F] Indication appears.
You can change between the Iris (F Number) Indication and the Shutter Speed Indication by repeatedly pressing the [PUSH] Dial.

3 **Turn the [PUSH] Dial to adjust the iris.**

Range of Iris Adjustment
CLOSE (Closed) → F16...F2.0 → OP (Opened)
+0 dB...OP+18 dB
The nearer to [CLOSE] a value you select, the darker the picture becomes.
The nearer to [OP+18 dB] a value you select, the brighter the picture becomes.
The figures with +dB show the Gain-up value. If you increase the value too much, the picture quality deteriorates.

Returning to the Normal Iris Value (F Number)
Press the [PUSH] Dial one time to make the [►F] Indication disappear. Or set the Mode Selector Switch to [AUTO].

- Manually adjusting the shutter speed after performing manual iris adjustment changes the iris back to automatic adjustment. Therefore, if you want to adjust both the shutter speed and iris manually, be sure to adjust the shutter speed first. **(→ 88)**



Playing Back with Special Effects

(Playback Digital Effects)

There are 8 different modes available for adding special digital picture effects to your recordings during playback. They are identical to the Digital Effects 1 and 2 **(➔ 74)** that can be used during recording.

❶ WIPE	❷ MIX
❸ STROBE	❹ NEGA
❺ SEPIA	❻ B/W
❼ TRACER	❽ SOLARI

1 Set the [POWER] Switch to [VCR].

2 Press the Play Button [▶].*

3 Press the [SELECT] Button on the Remote Controller to select the desired digital effect.

Repeatedly pressing the [SELECT] Button changes the selected digital effect in the order ❶ to ❽.

Selecting a digital effect is also possible by setting [EFFECT SELECT] on the [VCR MENU1] Menu to the desired effect.

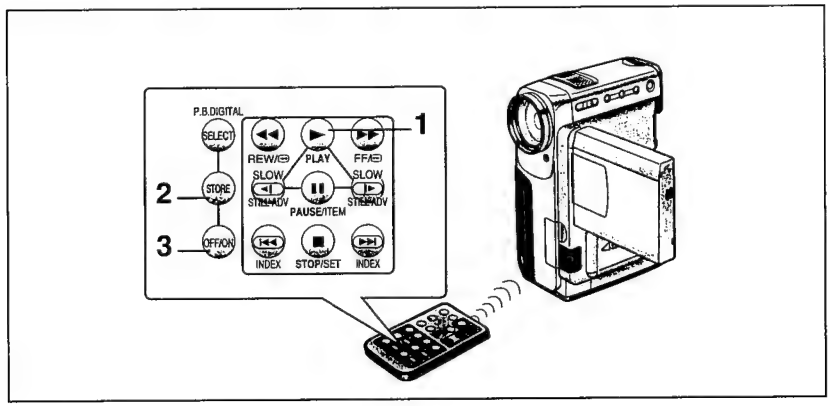
*The signal of the picture with a digital effect added during playback cannot be output from the DV Terminal **(➔ 10)** or the Digital Still Picture Terminal. **(➔ 126)**.

Suspending the Playback Digital Effect Temporarily

You can suspend and re-activate the digital effect by repeatedly pressing the [OFF/ON] Button ①. Suspending the digital effect is also possible by setting [EFFECT] on the [VCR MENU1] Menu to [OFF], and later to [ON] to re-activate it. When the digital effect is temporarily suspended, the indication of the selected effect flashes.

Cancelling the Digital Effect

Set [EFFECT SELECT] on the [VCR MENU1] Menu to [OFF].



Playing Back with Special Effects

(Playback Digital Effects) (Continued)

■ Wipe Function and Mix Function

After having selected [WIPE] or [MIX] in Step 3 on page 92:

1 Press the [▶] Button to start playback.

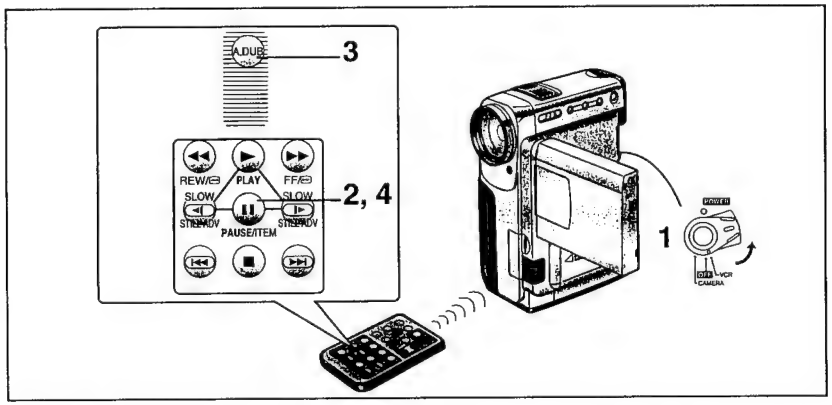
2 Press the [STORE] Button at the moment that you want to store as still image in memory.

The [WIPE] or [MIX] indication appears and the picture is stored in memory.

3 Press the [OFF/ON] Button at the scene at which you want to use a Wipe or Mix effect.

The scenes change with a Wipe or Mix effect.

- Operating the Wipe Function and the Mix Function during playback is only possible with the Remote Controller.
- It is not possible to add a Wipe or Mix effect during playback of an unrecorded part on the tape.
- If you press the [OFF/ON] Button while the Wipe or Mix is being performed, the effect is paused at that point. If you press the [OFF/ON] Button again, the effect resumes.



Adding New Sound on a Recorded Cassette (Audio Dubbing)

You can add music or narration on a recorded cassette.

- If [AUDIO REC] on the [CAMERA MENU2] Menu has been set to [16bit], performing audio dubbing erases the previously recorded sound. (If you intend to perform audio dubbing but also want to keep the original sound, be sure to set [AUDIO REC] to [12bit] before making the original recording.)
- It is not possible to perform audio dubbing onto recordings made in the LP Mode. **(➔ 24)**

1 Insert the recorded cassette and set the [POWER] Switch to [VCR].

2 At the point from which you want to insert the new sound, switch the Movie Camera over to the Still Playback Mode.

3 Press the [A.DUB] Button on the Remote Controller.

4 Press the Pause Button [❚❚] on the Remote Controller to start audio dubbing.

Stopping Audio Dubbing

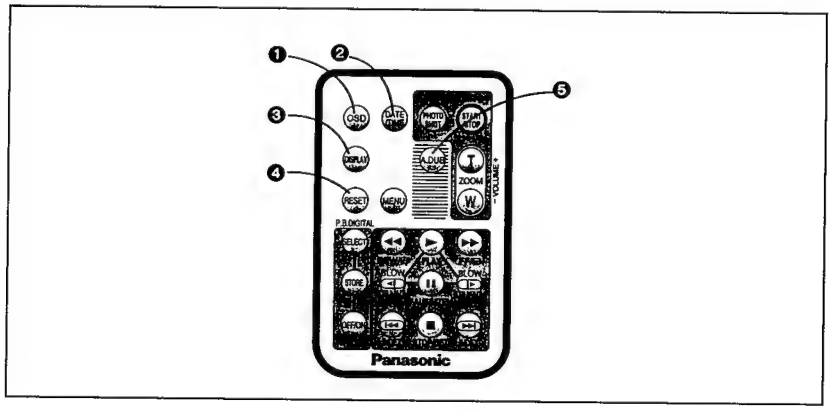
Press the Pause Button [❚❚] on the Remote Controller. The Movie Camera is again in the Still Playback Mode.

Playing Back the Sound Recorded with Audio Dubbing

Depending on the setting selected for [12bit AUDIO] on the [VCR MENU1] Menu, the sound added with audio dubbing and the original sound are played back as follows:

ST1: The original sound alone is played back.
ST2: The dubbed sound alone is played back.
MIX: The original sound and the sound added with audio dubbing are played back together.

- **Do not perform audio dubbing onto unrecorded parts of the tape. This could cause the playback picture and sound to be distorted.**
- If you reset the Tape Counter to zero at the point where you want the audio dubbing to end and turn on the Memory Stop Function (➔ 168), the audio dubbing automatically stops when the tape reaches that point.



Remote Controller

Using the wireless Remote Controller supplied with the Movie Camera allows operating most of the Movie Camera's major functions from a distance.

Buttons on the Remote Controller

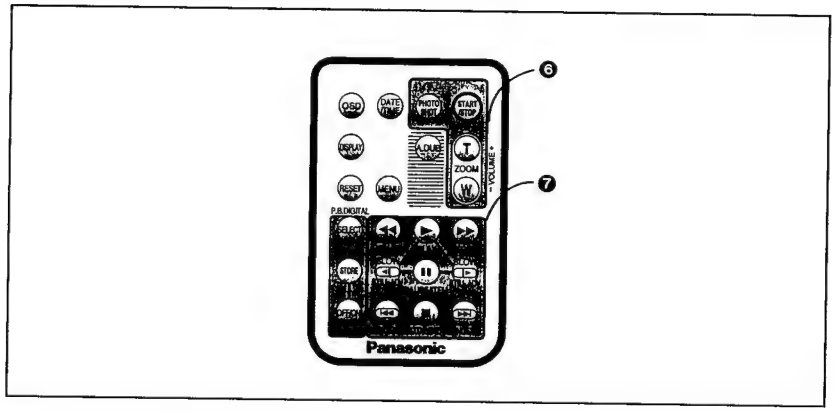
❶ Indication Output Button [OSD]
To display the function and operation indications on a connected TV. (➔ 54)

❷ Date and Time Button [DATE/TIME]
To make the Date/Time Indication appear or disappear in the picture during recording or playback. (➔ 46)

❸ Indication Shift Button [DISPLAY]
To select the desired Counter Indication.(➔ 176)

❹ Reset Button [RESET]
To reset the Tape Counter to zero.(➔ 168)

❺ Audio Dubbing Button [A.DUB]
To perform audio dubbing.(➔ 96)



❻ Controls for Recording and Sound Volume

Photoshot Button [PHOTO SHOT]
To record still pictures. (➔ 40)

Recording Start/Stop Button [START/STOP]
To start and pause recording. (➔ 32)

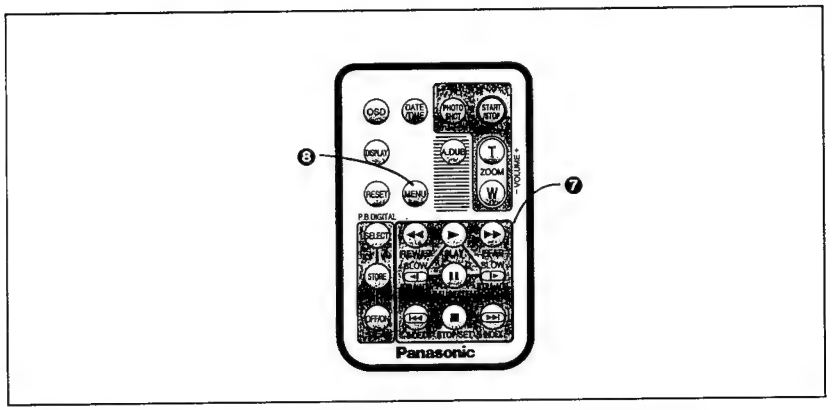
Zoom/Sound Volume Buttons [ZOOM/VOLUME]
CAMERA Mode: To zoom in and out. (➔ 38)
VCR Mode: To adjust the volume of the playback sound. (➔ 46)

❼ Controls for Playback and Menu Settings

Rewind/Review Button [◀◀]
To start review playback (➔ 48) if pressed during normal playback; and to rewind the tape if pressed in the Stop Mode.
Also to activate the Camera Search Function (➔ 58) in reverse direction if kept pressed in the Recording Pause Mode. Pressing it briefly activates the Recording Check Function (➔ 34).

Fast-forward/Cue Button [▶▶]
To start cue playback (➔ 48) if pressed during normal playback; and to fast-forward the tape if pressed in the Stop Mode.
Also to activate the Camera Search Function (➔ 58) in forward direction if kept pressed in the Recording Pause Mode.

Play Button [▶]
To start playback. (➔ 46)



❼ Controls for Playback and Menu Setting (Continued)

Slow Motion/Still Advance Button [◂I, I▸]
To perform Slow Motion Playback if pressed in the Normal Playback Mode; and to perform Still Advance Playback if pressed in the Still Playback Mode.
(➔ 50, 52)
(◂I: in reverse direction, I▸: in forward direction)

Index Search Button [I◂◂, ▸▸I]
To search for recorded scenes marked with an index signal and for still images recorded in the Photoshot Mode. **(➔ 62, 64, 66)**
(I◂◂: in reverse direction, ▸▸I: in forward direction)

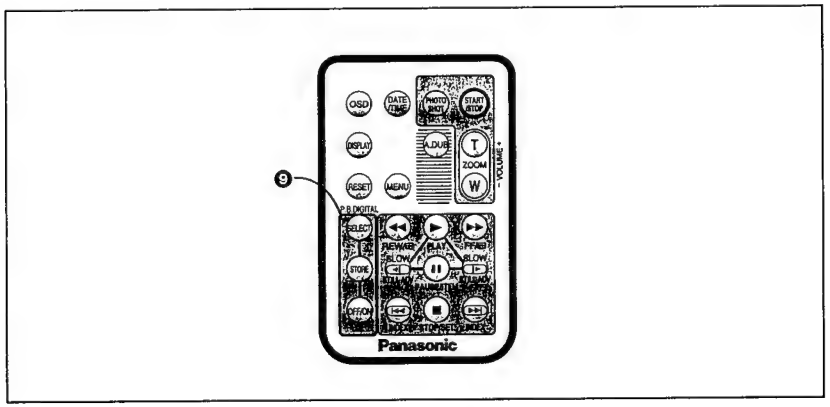
Stop Button [■]
To stop the tape. **(➔ 46)**

Pause Button [❚❚]
To pause playback. The playback picture stands still. **(➔ 52, 96)**

❽ Menu Button [MENU]
Pressing the Menu Button [MENU] displays the Menu.
In this case, the functions of the following buttons are changed:

Pause Button → Item Button
To select items on the Menu.

Stop Button → Setting Button
To set the mode for the selected item.

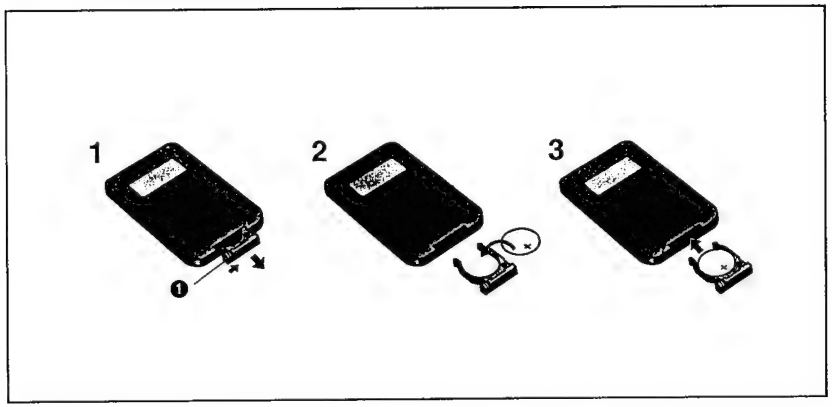


❾ Playback Digital Effects

Selection Button [SELECT]
To select the desired digital effect for [EFFECT SELECT] on the [VCR MENU1] Menu. **(➔ 92)**

Store Button [STORE]
To store a still picture in memory for the Wipe or Mix Function. **(➔ 94)**

Off/On Button [OFF/ON]
To suspend the selected digital mode or re-activate it. **(➔ 92)**
To start a Wipe or Mix transition from the still picture stored in memory. **(➔ 94)**



Remote Controller (Continued)

■ Inserting the Button-type Battery
Insert the supplied button-type battery before using the Remote Controller.

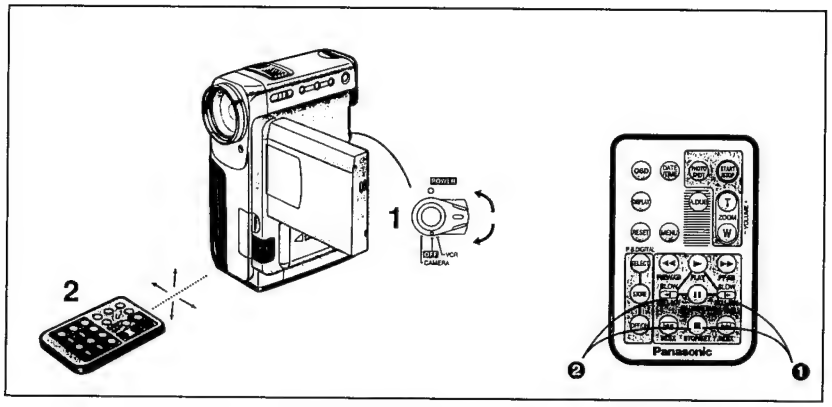
1 Pull out the Battery Holder while pressing the Stopper ❶.

2 Insert the button-type battery with the stamped (+) mark facing upward.

3 Insert the Battery Holder into the Remote Controller.

- When the button-type battery is exhausted, replace it with a new CR2025 battery.
  (The life of the battery is about 1 year. However, it depends on the frequency of use.)
- **Keep the button-type battery out of the reach of children.**
- Make sure you insert the battery with its poles correctly aligned.

CAUTION
Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the equipment manufacturer. Discard used batteries according to manufacturer's instructions.



■ **Using the Remote Controller**

1 Set the [POWER] Switch to [CAMERA] or [VCR].
When you want to perform recording operations, set the switch to [CAMERA]; and when you want to perform playback operations, set it to [VCR].

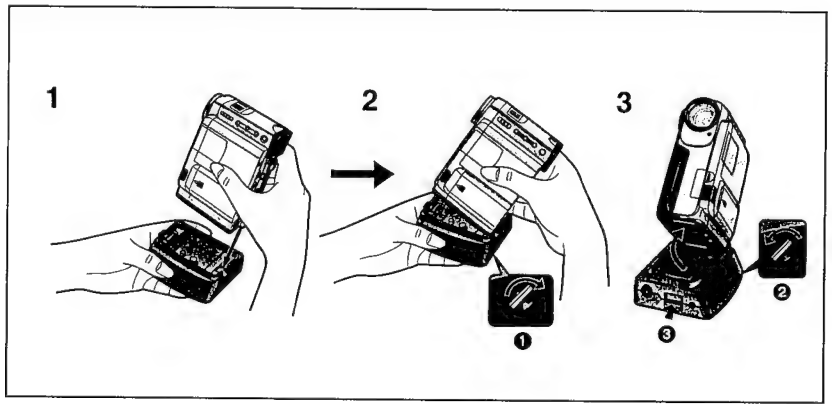
2 Aim the Remote Controller at the Remote Control Sensor on the Movie Camera and press the appropriate button.
Distance to the Movie Camera: Less than 5 metres.
Angle: Approximately 15° up, down, left and right from centre axis.

- The operative range described above is valid for using the Remote Controller indoors.
  When using it outdoors or under strong lights, it may not work correctly even within the above range.
- Within a distance of about 1 metre, it is also possible to use the Remote Controller from the side (LCD Monitor side).

Selecting the Remote Controller Mode
When using two Movie Cameras at the same time, selecting different Remote Controller Modes makes it possible to operate them separately.
- If the Remote Controller Mode set on the Movie Camera and on its Remote Controller are not matched, the [REMOTE] Indication appears.
- Replacing the button-type battery in the Remote Controller automatically resets it to the [VCR1] Mode.
- Set [REMOTE] on the Menu to the desired Remote Controller Mode.

Setting to Be Made on the Movie Camera:
Set [REMOTE] on the [CAMERA MENU3] Menu or on the [VCR MENU2] Menu to the desired Remote Controller Mode.

Setting to Be Made on the Remote Controller:
[VCR1]: Press the [▶] Button and [■] Button simultaneously. ❶
[VCR2]: Press the [◀] Button and [■] Button simultaneously. ❷



Using the Output Terminal Box [AV ONE TOUCH STATION]

When you want to connect the Movie Camera to a TV for playback or to other video equipment for editing and other purposes, attach the Output Terminal Box [AV ONE TOUCH STATION].

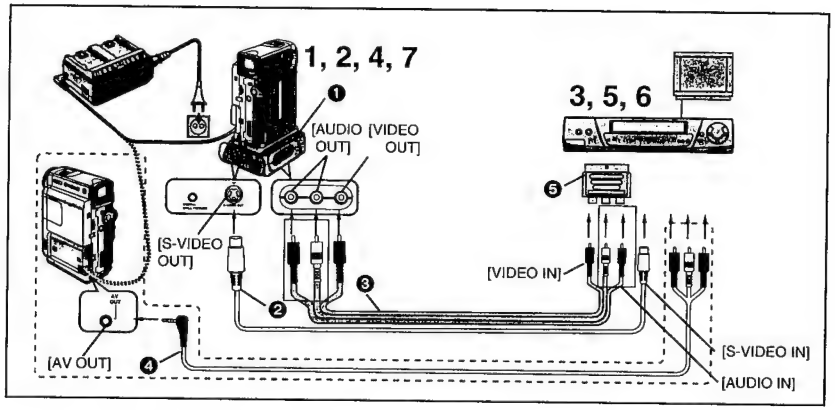
Attaching the Output Terminal Box [AV ONE TOUCH STATION]

1 Attach the Movie Camera to the Output Terminal Box [AV ONE TOUCH STATION] as shown above.

2 Fasten the locking screw ❶ to attach the Output Terminal Box securely.

Removing the Output Terminal Box [AV ONE TOUCH STATION]

3 Loosen the locking screw ❷ and remove the Output Terminal Box while pressing the [PUSH RELEASE] Button ❸.
Hold both the Movie Camera and the Output Terminal Box firmly to prevent them from dropping.



Copying onto an S-VHS (or VHS) Cassette (Dubbing)

You can copy the picture and sound recorded on this Movie Camera onto an S-VHS or VHS cassette in a home video recorder.
After making the connections shown above, perform the necessary operations.
- Before copying, be sure to press the [OSD] Button on the Remote Controller (➔ 100) so that no indications are visible. Otherwise, the displayed tape counter and function indications are also copied.

Movie Camera:

1 Set the [POWER] Switch to [VCR].

2 Insert the recorded cassette.

VCR:

3 Insert an unrecorded cassette with intact erasure prevention tab.
As some settings (external input, tape speed, etc.) on the VCR are necessary, please refer to your VCR's operating instructions.

Movie Camera:

4 Press the Play Button [▶] to start playback.

VCR:

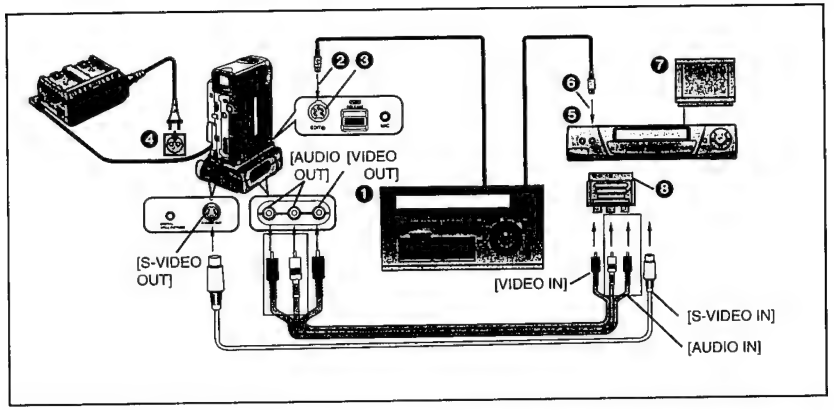
5 Start recording.

6 Press the Pause or Stop Button to stop recording.

Movie Camera:

7 Press the Stop Button [■] to stop playback.

❶ Output Terminal Box [AV ONE TOUCH STATION]
❷ S-Video Cable
❸ AV Cable (PHONO-PHONO)
❹ AV Cable (PHONO-M3)
❺ 21-Pin Adaptor



Copying with the Help of an Editing Controller

If you connect the Movie Camera to an Editing Controller equipped with 5-pin Edit Socket, this Movie Camera's playback functions can be controlled from the Editing Controller.
(The Output Terminal Box [AV ONE TOUCH STATION] is necessary.)

After connecting all equipment as shown above, perform the necessary operations.

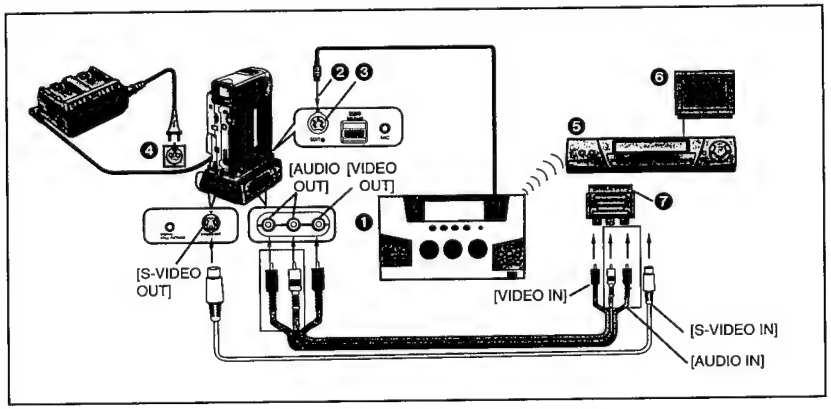
When Connecting the Editing Controller VW-EC500E ❶ (optional)

- A VCR equipped with 5-pin Edit Socket is necessary.
- When you connect the VW-EC500E to the Movie Camera, an adjustment on the VW-EC500E is necessary. For the operation of the Editing Controller, refer to its operating instructions.

When Editing with Time Code
Press the [DISPLAY] Button on the Remote Controller to make the Time Code appear.

- When the Time Code is displayed, the Time Code Signal is output from the Edit Socket.
- When the Counter Indication is displayed, the Linear Tape Counter Signal is output.

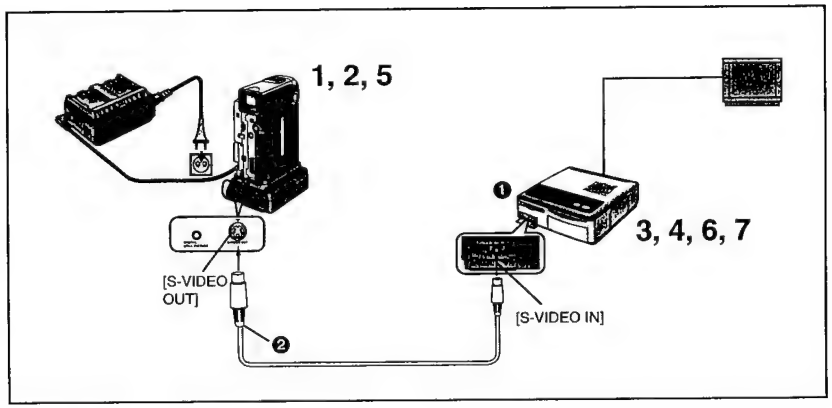
❷ To Edit Socket
❸ Edit Socket
❹ Connect the AC Adaptor.
❺ VCR (not supplied)
❻ To Edit Socket
❼ TV (not supplied)
❽ 21-Pin Adaptor



When Connecting the Editing Controller VW-EC1E (optional)

- When you use the Editing Controller VW-EC1E ❶, it is not necessary to connect it to the Edit Socket on the VCR, as the VCR's operation is performed via infrared remote control. Therefore, editing is also possible onto VCRs not equipped with an Edit Socket.
- For the operation of the Editing Controller, refer to its operating instructions.

❷ To Edit Socket
❸ Edit Socket
❹ Connect the AC Adaptor.
❺ VCR (not supplied)
❻ TV (not supplied)
❼ 21-pin Adaptor



Using the Movie Camera with a Video Printer

If you connect the Movie Camera to a Video Printer ❶, you can print still pictures from scenes recorded with the Movie Camera.

Movie Camera:

1 **Set the [POWER] Switch to [VCR].**

2 **Insert a recorded cassette.**

Video Printer:

3 **Turn the Video Printer on.**

4 **If the Video Printer is equipped with Digital Image Stabilizer Function and/or Moving/ Still Picture Mode, adjust them according to the picture being input.**

Movie Camera:

5 **Press the Play Button [▶].**

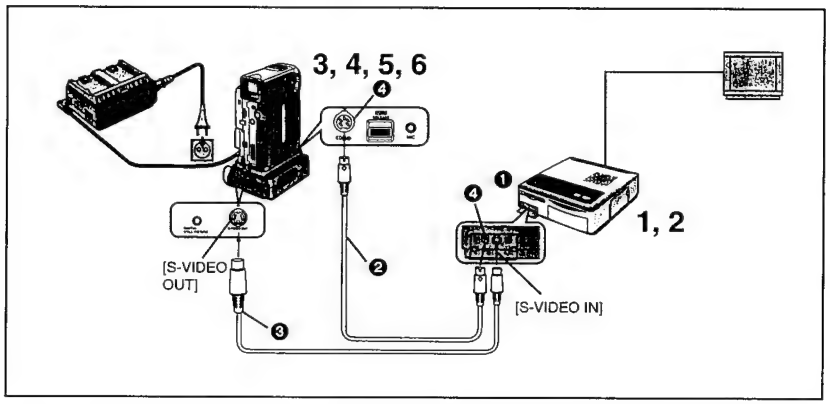
Video Printer:

6 **Store the image in memory.**

7 **Start printing.**

For details about the operation of the Video Printer, read its operating instructions.

❷ S-Video Cable



Using the Automatic Printing Function (Autoprint)

If you connect the Movie Camera to a Video Printer ❶ equipped with 5-pin Edit Socket, you can use the Autoprint Function to automatically print all still pictures recorded in the Photoshot Function.

Video Printer:

1 Turn the Video Printer on.

2 Make the necessary settings on the Video Printer according to the input signal.

Movie Camera:

3 Set the [POWER] Switch to [VCR].

4 Search for the first still picture from which you want to start printing with the Autoprint Function.
If you want to print all still pictures recorded on the cassette, rewind the tape to its beginning.

5 Press the [MENU] Button.

6 Set [AUTOPRINT] on the [VCR MENU2] Menu to [ON].
Automatic printing starts.

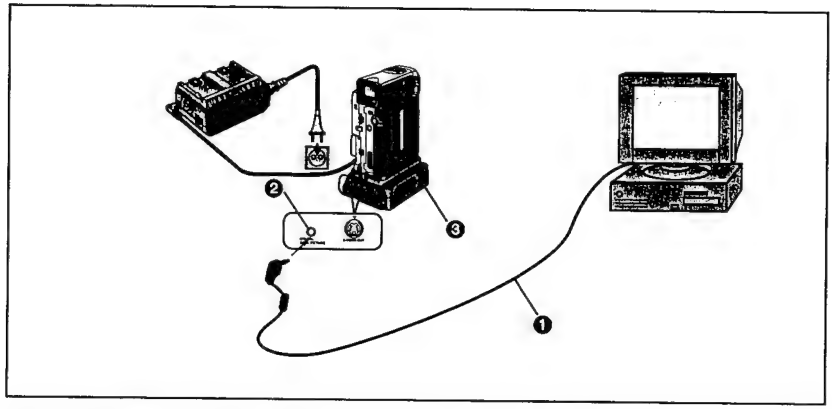
- If you want to stop the automatic printing in the middle, press the Stop Button [■] on the Movie Camera.

❷ Edit Cable VW-K5E (optional)

❸ S-Video Cable

❹ Edit Socket

- When the cooling function of the Video Printer activates and the printing speed slows down, automatic printing may stop. In this case, set [AUTOPRINT] on the [VCR MENU2] Menu to [ON] again.
- If you replace the ink cassette or paper during printing, the same picture may be printed twice.
- If still pictures are recorded successively in the Photoshot Mode, some pictures may be skipped during printing.
- Before storing an image in memory on the Video Printer, press the [OSD] Button (➔ 100) on the Remote Controller of the Movie Camera so that no indications appear in the picture. Otherwise, the Counter Indication and other function indications are also printed in the picture.
- In the following cases, some pictures may be skipped when printing with the Autoprint Function.
  - When you print still pictures recorded in the Photoshot Mode on a video camera of another brand.
  - If you turn the Movie Camera on and off several times (3 times or more) between recording two still pictures in the Photoshot Mode.
  - When you record a still picture in the Photoshot Mode on the same part of a cassette where a Photoshot picture was recorded before.
  - When you select a different recording speed (SP/LP) between the recording of two still pictures in the Photoshot Mode.
  - At the first Photoshot picture to be printed.



Using the Movie Camera with a Computer

The Personal Computer Connection Kit VW-DTA1E (optional) for Digital Video Cameras makes it possible to connect the Movie Camera to a computer and transmit still video images to it. (The Output Terminal Box [AV ONE TOUCH STATION] is also necessary.)

Computer System Requirements

DV STUDIO can be installed in a PC/AT personal computer which can run Microsoft® Windows® 95.

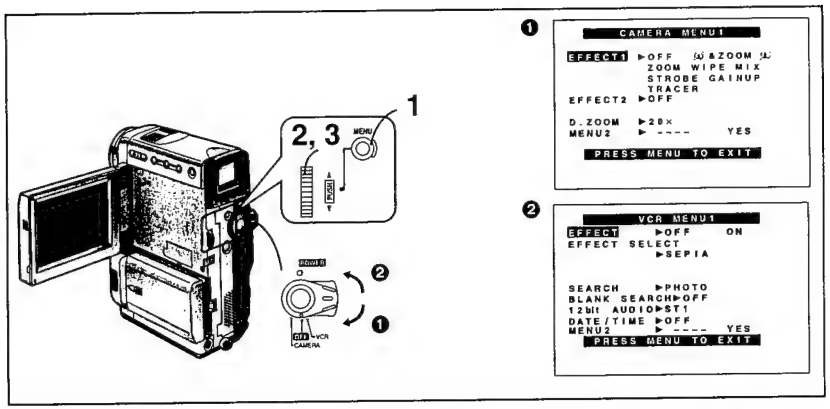
Compatible machines:	Personal computer with 80486DX4 or higher CPU (Pentium™ or higher recommended)
Graphic card:	True Color (approx. 16.7 million colours) recommended (operation also possible even with 256 colours)
Installed memory:	16 MB or more (32 MB or more recommended)
Free hard disk space:	At least 10 MB
Disk drive:	CD-ROM drive
Serial port:	RS-232C (D-sub 9pin)
Other requirements:	Mouse

To connect the Movie Camera to the computer, use the special Interface Adaptor ❶ contained in the Personal Computer Connection Kit.

- When using the Personal Computer Connection Kit, the [POWER] Switch on the Movie Camera must be set to [VCR].
- Pictures that you intend to import into computer applications should be recorded in the SP Mode.
- When recording, take care that the Time Code is uninterrupted from the beginning of the tape.
- Windows® 95 is a trademark of Microsoft Corporation U.S.A.
- All other company and product names in the operating instructions are trademarks of their respective corporations.

❷ Digital Still Picture Terminal

❸ Output Terminal Box [AV ONE TOUCH STATION]



Using the Menu Screen

This Movie Camera displays the settings of various functions in Menus to make it easy to select the desired functions and settings.

1 Press the [MENU] Button.
The Menu appears.

2 Turn the [PUSH] Dial to select the item to be set.
Turning the [PUSH] Dial changes the item highlighted in green.

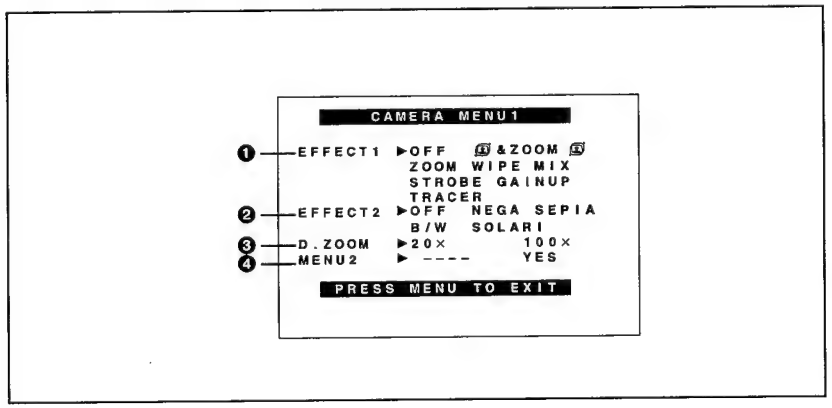
3 Press the [PUSH] Dial to set the selected item to the desired mode.
Every press moves the cursor [▶] to the next mode.

Displaying the Camera Mode Menu ❶
Press the [MENU] Button in the Recording Pause Mode.
- While the Menu is displayed, recording is not possible.
- During recording, displaying the Menu is not possible.

Displaying the VCR Mode Menu ❷
Press the [MENU] Button when the [POWER] Switch is set to [VCR].
- While the Menu is displayed, playback is not possible.
- During playback, displaying the Menu is possible.

Exiting the Menu
Press the [MENU] Button again.

Note About the Settings Made on the Menu
The settings you selected on the Menu are maintained when you turn the Movie Camera off. However, if you disconnect the power supply unit (Battery or AC Adaptor) from the Movie Camera before turning it off, the selected settings may not be maintained.



Menu Functions

The illustrations of the menus are intended for explaining the functions; the actual menus look somewhat different.

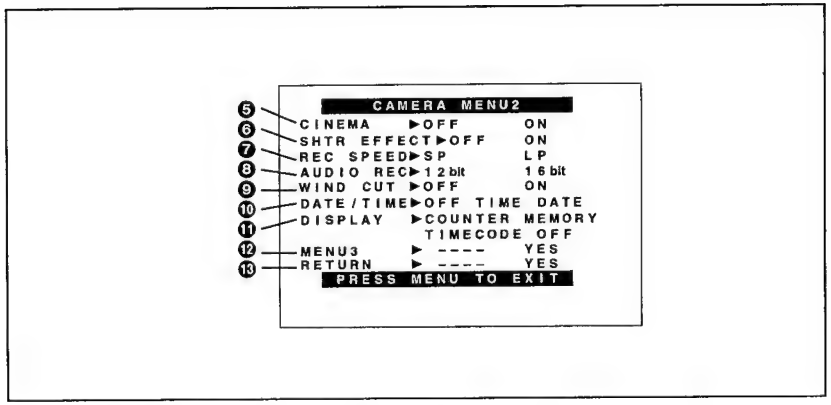
Camera Mode Menu
[CAMERA MENU1]

❶ Digital Effects 1 [EFFECT1] (➔ 74, 76)

❷ Digital Effects 2 [EFFECT2] (➔ 74, 76)

❸ Digital Zoom [D.ZOOM] (➔ 38)

❹ Advancing to Menu 2 [MENU2] (➔ 132)
If you set [MENU2] to [YES], the Menu changes to the [CAMERA MENU2] Menu.



Camera Mode Menu (Continued)
[CAMERA MENU2]

❺ Cinema-like Format Recording [CINEMA] (➔ 42)

❻ Shutter Effect [SHTR EFFECT] (➔ 40)

❼ Recording Speed Mode [REC SPEED] (➔ 24)

❽ Audio Recording Mode [AUDIO REC] (➔ 96)

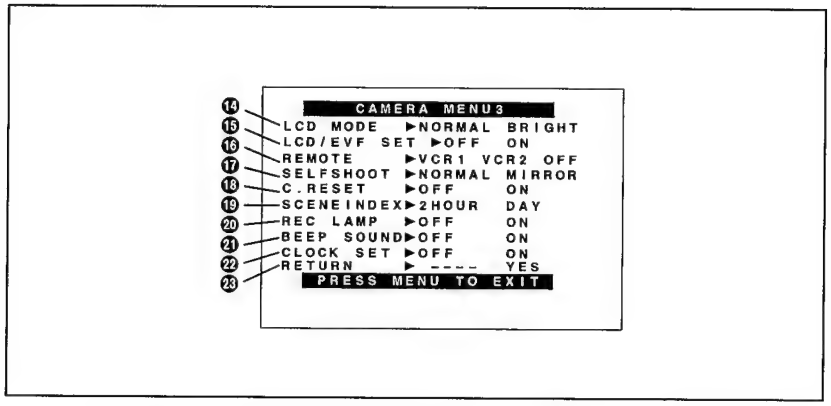
❾ Wind Noise Reduction [WIND CUT]
If you set [WIND CUT] to [ON], the noise of the wind hitting the microphone is reduced. However, this also causes a slight deterioration of the sound reproduction in the bass range.

❿ Date and Time Indication [DATE/TIME] (➔ 46)

⓫ Counter Display Mode [DISPLAY] (➔ 176)

⓬ Advancing to Menu 3 [MENU3] (➔ 134)
If you set [MENU3] to [YES], the Menu changes to the [CAMERA MENU3] Menu.

⓭ Returning to the Previous Menu [RETURN]
If you set [RETURN] to [YES], the Menu changes back to the [CAMERA MENU1] Menu.



Camera Mode Menu (Continued)
[CAMERA MENU3]

⑭ **LCD Lighting Mode [LCD MODE] (➔ 142)**

⑮ **LCD and Finder Adjustment [LCD/EVF SET] (➔ 142)**

⑯ **Remote Controller Mode [REMOTE] (➔ 110)**

⑰ **Self-Recording [SELFSHOOT] (➔ 36)**

⑱ **Counter Reset [C.RESET] (➔ 168)**
To reset the counter to zero.
However, the Time Code cannot be reset.

⑲ **Scene Index Mode [SCENEINDEX] (➔ 66)**

⑳ **Recording Lamp [REC LAMP] (➔ 32)**

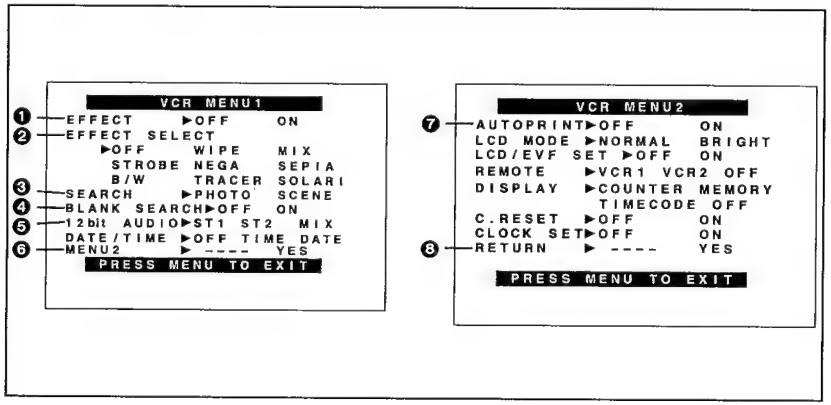
㉑ **Beep Sound [BEEP SOUND]**

If you set [BEEP SOUND] to [ON], a confirmation/ alarm beep sound is emitted in the following cases:

- When you turn on the Movie Camera.
- When you start recording and pause recording.
- When the tape reaches its end during recording, or when the tape has reached its end and you try to start recording.
- When you try to start recording without having inserted a cassette.
- When you insert a cassette with its erasure prevention slider set to [SAVE] and try to start recording.
- When condensation has formed inside the Movie Camera.

㉒ **Date and Time Setting [CLOCK SET] (➔ 138)**

㉓ **Returning to the Previous Menu [RETURN]**
If you set [RETURN] to [YES], the Menu changes back to the [CAMERA MENU2] Menu.



VCR Mode Menu
[VCR MENU1]

❶ **Digital Effect On/Off [EFFECT] (➔ 92)**

❷ **Digital Effect Selection [EFFECT SELECT] (➔ 92)**

❸ **Index Search Mode [SEARCH] (➔ 62, 64, 66)**

❹ **Blank Search [BLANK SEARCH] (➔ 60)**

❺ **Audio Output Mode [12bit AUDIO] (➔ 98)**

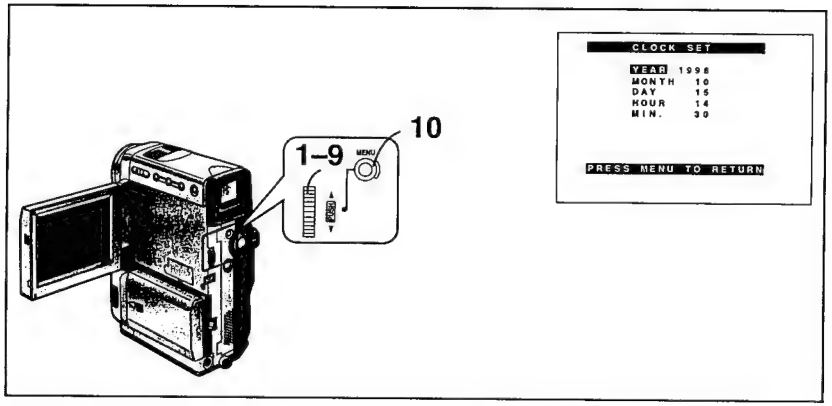
❻ **Advancing to Menu 2 [MENU2]**
If you set [MENU2] to [YES], the Menu changes to the [VCR MENU2] Menu.

[VCR MENU2]

❼ **Automatic Printing [AUTOPRINT] (➔ 122)**

❽ **Returning to the Previous Menu [RETURN]**
If you set [RETURN] to [YES], the Menu changes back to the [VCR MENU1] Menu.

•All other items on the VCR Mode Menus are the same as on the Camera Mode Menus.



Setting the Date and Time

If you set [CLOCK SET] either on the [CAMERA MENU3] Menu or [VCR MENU2] Menu to [ON], the Menu shown above appears.

For example: To set the clock to 15th October 1998, 14:30.

1 **Turn the [PUSH] Dial to set to [1998].**
The years change in the following order:
1990→1991→...→2089→1990→...

2 **Press the [PUSH] Dial to select [MONTH].**

3 **Turn the [PUSH] Dial to set to [10].**

4 **Press the [PUSH] Dial to select [DAY].**

5 **Turn the [PUSH] Dial to set to [15].**

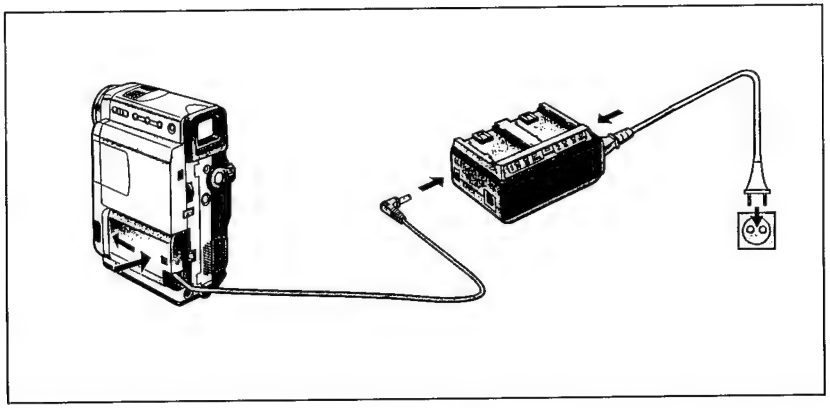
6 **Press the [PUSH] Dial to select [HOUR].**

7 **Turn the [PUSH] Dial to set to [14].**

8 **Press the [PUSH] Dial to select [MIN.].**

9 **Turn the [PUSH] Dial to set to [30].**

10 **Press the [MENU] Button to finish the date and time setting.**
The operation of the clock starts from [00] seconds.

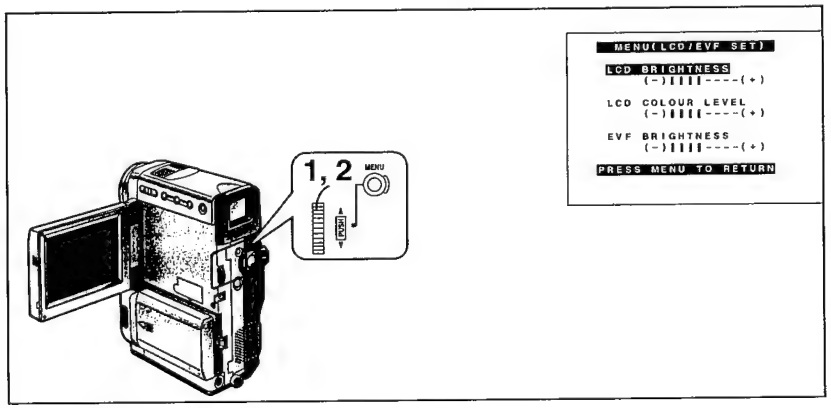


Charging the Built-in Lithium Battery
The built-in battery maintains the operation of the clock. When the [⊠] Indication appears, the built-in lithium battery is discharged. Charge the discharged battery in the following way and after charging is finished, set the date and time.

1 **Connect the AC Adaptor to the Movie Camera and to an AC mains socket.**
(→ 16)

2 **Leave the Movie Camera turned off.**

3 **Leave the Movie Camera in this condition for approximately 4 hours.**
After charging for 4 hours, the built-in lithium battery can power the clock for approximately 3 months.



Adjusting the Brightness and Colour Level of the LCD Monitor/ Finder

If you set [LCD/EVF SET] on the [CAMERA MENU3] Menu or [VCR MENU2] Menu to [ON], the following items are displayed:

LCD Brightness [LCD BRIGHTNESS]
To adjust the brightness of the picture on the LCD screen.

LCD Colour Level [LCD COLOUR LEVEL]
To adjust the colour saturation of the picture on the LCD screen.

Finder Brightness [EVF BRIGHTNESS]
To adjust the brightness of the picture in the Finder.

1 **Press the [PUSH] Dial to select the item that you want to adjust.**

2 **Turn the [PUSH] Dial to increase or decrease the vertical bars of the Bar Indication.**
The Bar Indication is divided into 8 steps. The more vertical bars are shown, the stronger is the brightness or colour saturation.

If you use the Remote Controller for this adjustment, press the [ITEM] Button and then adjust the brightness or colour saturation by pressing the [SET] Button. The number of the bars gradually increases toward the right end, and then it decreases again.

Increasing the Brightness of the LCD Monitor's Backlighting
Set [LCD MODE] either on the [CAMERA MENU3] Menu or [VCR MENU2] Menu to [BRIGHT].

- All adjustments explained on this page have no influence on the actually recorded picture.

Cautions for Use

Take care that no water enters the Movie Camera when using it in the rain and snow or on the beach.
- The Movie Camera and the cassette could become damaged. (It might not be repairable.)

Keep the Movie Camera away from magnetized equipment (TVs, Video games, etc.).
- If you use the Movie Camera on or near a TV, the electromagnetic radiation may cause picture and sound distortion.
- Strong magnetic fields generated by speakers and large motors may damage the recordings on the tape and distort the picture.
- The electromagnetic radiation from microprocessors can adversely influence the Movie Camera and cause picture and sound distortion.
- If the Movie Camera is adversely influenced by magnetized equipment and does not work correctly, turn the Movie Camera off, remove the Battery or disconnect the AC Adaptor and attach the Battery or connect the AC Adaptor again. Then turn the Movie Camera on.

Do not use the Movie Camera near a radio transmitter or high-voltage power line.
- If you record near a radio transmitter or high-voltage power line, the recorded picture and sound may be adversely influenced.

Do not use the Movie Camera for surveillance and other industrial applications.
- If the Movie Camera is being used for a long time, the inside temperature could rise excessively and this may cause malfunction.
- This Movie Camera is not designed for industrial use.

Take care that no sand and fine dust enters the Movie Camera when using it on a beach or similar places.
- Sand and dust could damage the Movie Camera and cassette. (Be careful when inserting and removing the cassette.)

Do not spray insecticide or volatile agents on the Movie Camera.
- Such agents could deform the body and cause the surface coating to peel off.
- Do not leave the Movie Camera in direct contact with rubber or plastic products for a long time.

Do not use benzine or thinner for cleaning.
- They could deform the body and cause the surface coating to peel off.
- Before cleaning, remove the Battery or unplug the AC Mains Cable from the AC mains socket.
- Wipe the Movie Camera with a soft, clean cloth. To remove persistent stains, wipe with a cloth moistened with mild detergent diluted with water, and then finish with a dry cloth.

After use, always take out the cassette and remove the Battery or unplug the AC Mains Cable from the AC mains socket.
- If you leave the cassette in the Movie Camera, the tape can become loosened and damaged.
- If you leave the Battery attached to the Movie Camera for a long time, the voltage level may drop excessively so that the Battery cannot be used any more even after charging.

■ Condensation

Determining Whether Condensation Has Formed Inside and Remedy for Condensation
If the Condensation Indication flashes after you turn on the Movie Camera, condensation has formed inside the Movie Camera. In this case, the Movie Camera automatically switches off after a few seconds.
Remedy as follows:

1 Take out the cassette.
All other functions do not work. Depending on the amount of condensation, it may not be possible to take out the cassette. In this case, wait 2–3 hours before taking out the cassette.

2 Leave the Cassette Compartment open and wait for 2–3 hours.
The required time depends on the amount of condensation and the ambient temperature.

3 After 2–3 hours, turn the Movie Camera on and check if the Condensation Indication is not displayed.
Even if the Condensation Indication is no longer displayed, wait 1 more hour for added safety before using the Movie Camera again.

Pay Attention to Condensation Even Before the Condensation Indication Appears.
- As condensation forms gradually, the Condensation Indication may not appear for the first 10–15 minutes after condensation has formed inside.
- In an extremely cold place, the condensation could freeze and turn into frost. In such a case, it takes an additional 2–3 hours for the frost to first melt into condensation and then to be dissolved.

Remedy for a Fogged-up Lens
Set the [POWER] Switch to [OFF] and leave the Movie Camera in this condition for about 1 hour. When the lens has reached about the same temperature as its surroundings, it automatically clears up.

■ Video Head Clogging and Remedy

When the video heads (which contact the tape) are dirty, the playback picture contains mosaic-like patterns or the whole screen becomes black. If they become even more dirty, the recording performance deteriorates and in the worst case, recording may not be possible at all.

Causes of Dirty Video Heads
- A lot of dust in the air
- High-temperature and high-humidity environment
- Damaged tape
- Long-time use

Using the Mini-DV Format Digital Video Head Cleaner (not supplied)

1 Insert the Head Cleaner into the Movie Camera in the same way as a video cassette.
2 Press the Play Button [▶], and after approximately 20 seconds press the Stop Button [■]. (Do not rewind the tape.)
3 Take out the Head Cleaner. Insert a video cassette, perform recording and then play it back to check the picture.
4 If the picture is still not clear, repeat above operation steps 1 - 3. (Do not use the Head Cleaner more than 3 times in succession.)

Notes:
- Do not rewind the tape in the Head Cleaner after every use. Rewind it only after the tape has reached its end, and then use it again in the same way from the beginning.
- If the video heads again become clogged with dirt soon after cleaning, this might be caused by a damaged tape. In this case, stop using that cassette immediately.
- Be careful not to clean the video heads too much. (Too much cleaning could cause excessive wear to the video heads. If the video heads get worn, the picture is not played back clearly even after cleaning.)
- If using the Head Cleaner does not clear the video head clogging, the Movie Camera requires cleaning or repairing by a service centre.
  Please consult with your dealer.
- This Video Head Cleaner is available from Panasonic service centres.

Periodic Inspection
To ensure optimum picture quality, we recommend that you have worn-out parts such as video heads replaced after approximately 1000 hours of use. (However, this depends considerably on the conditions of use such as temperature, humidity and dust.)

■ Optimum Use of the Battery

Special Characteristics of the Battery
This Battery is a rechargeable lithium-ion battery. Its ability to generate electric energy is based on an internal chemical reaction. This reaction is easily influenced by ambient temperature and humidity, and the useful operation time that the Battery can provide becomes shorter at high and low temperatures. When used in extremely cold surroundings, the Battery may only be able to provide approximately 5 minutes of operation time. If the Battery becomes extremely hot, a protection function is activated and prevents the use of the Battery for some time.

After Use, Always Remove the Battery.
Be sure to remove the Battery from the Movie Camera. (If it is attached to the Movie Camera, a small amount of electric current is consumed even if the Movie Camera is turned off.) Leaving the Battery attached to the Movie Camera for a very long time could cause it to become excessively discharged, so that it cannot be used any more even after charging.

Keep the Battery's Terminals Clean.
Be careful that the terminals do not get plugged up with dust, dirt or other substances.
If you accidentally drop the Battery, confirm that the Battery itself and the terminals are not deformed. Attaching a deformed Battery to the Movie Camera or to the AC Adaptor could damage the Movie Camera or the AC Adaptor.

Discarding a Battery That Has Become Unusable
- The usable life of the Battery is limited.
- Do not throw the Battery in a fire because it could explode.

■ When the Charge Lamps on the AC Adaptor Flash as Warning

If the ambient temperature is extremely low or high, the Charge Lamps on the AC Adaptor flash. They also flash when some defect has occurred in the Battery or the AC Adaptor.

When the Charge Lamps Flash Slowly
The Battery is being charged, but charging takes longer than normally.

When Only the [80%] Charge Lamp Flashes
Charging is not possible. Remove the Battery once and wait a few minutes, and then re-attach it again for charging.

When the [50%] and [100%] Charge Lamps Flash Alternately, or When No Charge Lamps Light
Remove and then re-attach the Battery. Or, attach the Battery to the Movie Camera and perform playback (or some other operation) for 10 - 20 minutes. Then remove the Battery and attach it again to the AC Adaptor. If charging is still impossible, some malfunction has occurred in the Battery or the AC Adaptor. Please consult with your dealer.

■ Precautions for Storage

Before Storing the Movie Camera, Take out the Cassette and Remove the Battery.
Store all equipment in a dry place where the temperature remains relatively constant. (Recommended temperature is 15°C–25°C and recommended relative humidity is 40%–60%.)

Movie Camera
- Wrap it with a soft cloth to prevent dust from entering.

Battery
- Extremely low or high temperature shortens the Battery life.
- Storing it in places with oily smoke and a lot of dust could cause the terminals to get rusty, and this can result in malfunction.
- **Do not allow metal objects (such as necklaces and hair pins) to touch the battery terminals. Short-circuiting may occur and generate heat, and touching it in this condition could inflict serious burns.**
- Store the Battery in discharged condition. If you store the Battery for a long time, we recommend that you charge it once a year and completely use up the charge before storing it again in discharged condition.

Cassette
- Rewind the tape to its beginning before storing. Leaving the cassette with the tape stopped halfway for more than 6 months (depending on the storing condition) loosens the tape. Be sure to rewind it to the beginning.
- Put the cassette in its case to store it. Dust, direct sunlight (ultraviolet rays) and humidity could damage the tape. Dust contains hard mineral particles and cassettes with dust damage the video heads and other parts of the Movie Camera. Make it a habit to always put the cassette back into its case.
- Completely wind the tape forward and then rewind it once every half year. Leaving the cassette for more than a year without winding/rewinding may deform the cassette because of stretching and shrinking of the tape due to changes in temperature and humidity. Also, the tape may stick together.
- Do not place the cassette near strongly magnetized objects or equipment.
- The tape surface is coated with microscopic magnetic particles and they record signals. Such objects as magnetic necklaces and toys have stronger magnetic force than commonly thought, and this could erase the recorded contents and cause noise in picture and sound.

■ LCD Monitor/Finder/MC Protector/ Microphone Socket

LCD Monitor
- In places where big changes in temperature occur, condensation may form on the LCD Monitor. Wipe it with a soft, dry cloth.
- If the Movie Camera is very cold when it is turned on, the picture on the LCD Monitor is initially a little darker than normally. However, as the internal temperature rises, the LCD Monitor regains its normal brightness.
- Extremely high precision technology is employed in producing the LCD Monitor. The result is more than 99.99% effective pixels with a mere 0.01% of the pixels inactive or always lit. However, this is not a malfunction and does not affect the recorded picture.

Finder
- Extremely high precision technology is employed in producing the Finder screen. The result is more than 99.99% active pixels, with a mere 0.01% of the pixels inactive or always lit. However, this is not a malfunction and does not affect the recorded picture.
- Do not leave the Finder or the Lens aimed at the sun. This could seriously damage internal parts.

MC Protector
- When you want to attach a filter or conversion lens with a diameter of 30.5 mm, be sure to first remove the MC Protector by turning it counterclockwise. When you slide the [W/T] Zoom Lever toward [W] after attaching a filter or conversion lens, the four corners of the picture may become dark (vignetting effect).
- If you attach both a filter and a conversion lens, the four corners of the picture may become dark (vignetting effect). For details, please also read the operating instructions of the accessory being used.

Microphone Socket
- If you want to perform audio dubbing via an external microphone or audio equipment, connect it to the [MIC] Socket on the Output Terminal Box [AV ONE TOUCH STATION]. In this case, the Movie Camera's built-in microphone is turned off.

■ Listening to the Playback Sound via Headphones
If you want to use headphones to listen to the playback sound, connect them to the supplied Headphone Conversion Adaptor and then connect the Headphone Conversion Adaptor to the [AV OUT] Socket on the Movie Camera. In this case, no sound (including beep and shutter click sounds) is reproduced from the Movie Camera's built-in speaker, and the volume of the playback sound cannot be adjusted.

Glossary

■ Digital Video System
In the digital video system, picture and sound are converted into digital signals and recorded onto the tape.
This completely digital recording allows recording and playback of picture and sound with minimum quality deterioration.
In addition, such data as Time Code, Date and Time are also automatically recorded as digital signals.

Features
- Superior picture resolution
- Excellent signal-to-noise ratio
- Stable pictures
- Minimised quality deterioration in dubbing
- Minimised cross colour distortion
- PCM digital sound
- No picture deterioration in LP Mode
- 6.35 mm-wide tape
- Compact cassette with long recording time
- Minimised quality deterioration in editing
- Time Code editing

Compatibility with S-VHS or VHS Cassettes
As this Movie Camera uses a digital method for recording picture and sound, there is no compatibility with conventional S-VHS or VHS video equipment using analog recording methods.
In addition, the size and shape of the cassette are completely different.

Compatibility with Output Signals
As the video and audio signals output from the audio and video output sockets are analog—the same as in conventional video systems—you can connect this Movie Camera to your S-VHS or VHS VCR or TV for playback.

PCM Digital Sound
For recording of the sound, this Movie Camera offers the choice between two different PCM Audio Recording Modes.
- 16 bit, 48 kHz, 2 channels
- 12 bit, 32 kHz, 4 channels

The "16 bit, 48 kHz, 2 channels" Mode offers superior recording sound quality.
The "12 bit, 32 kHz, 4 channels" Mode lets you record the original sound in stereo on two channels and the dubbed sound in stereo on two separate channels.

Sub Code
The digital recording system offers the added capability of recording sub code containing various data.
The following data is recorded as sub code on this Movie Camera:
- Time code
- Recording date and time
- Index signals for locating still images recorded in the Photoshot Mode
- Index signals for locating the beginning of scenes marked with index signal

■ Focus
If you look at an object through a magnifying glass and move it closer or further away from your eye, you will reach a point where the object becomes clearly visible. Being focused or in focus means that the subject can be seen with optimum clarity and sharpness.

Human Eyes
Human eyes have lenses as well, and when we look at objects at different distances, the shape of these lenses changes automatically so that we can always see these objects clearly.

Movie Camera
The image of the subject enters the Movie Camera through the lens and is converted into an electric signal (video signal) for recording onto magnetic tape. The focus is adjusted either manually or automatically by moving a focusing lens.

Auto Focus Adjustment
The Auto Focus System automatically moves the internal focusing lens forward or backward and adjusts the focus so that the subject can be seen clearly.
The Auto Focus Adjustment has the following characteristics:
- It adjusts until the vertical contours of the subject are as sharp and clean as possible.
- It adjusts the focus on the subjects with strong contrast.
- It adjusts the focus on the subject in the centre of the LCD Monitor or Finder. Unlike human eyes, the lens of the Movie Camera cannot instantaneously change the focus from a nearby to a distant subject and vice versa.

Lens Unit
The lens construction used in this Movie Camera generates some clicking noise if the Movie Camera is rocked up and down while it is turned off. This is not a malfunction of the lens unit. This noise does not occur when the Movie Camera is turned on.

For the following subjects and recording situations, the Auto Focus System cannot provide precise adjustment.
Use the Manual Focus Mode instead. (→ 86)

❶ Recording subjects with a part of it near the Movie Camera and another part far away from it
As the Auto Focus adjusts on the centre part of the image, it is often impossible to bring the nearby and distant parts of the subject into focus.
When you want to record a person with a distant mountain in the back, it is not possible to focus on both.

❷ Recording subjects behind glass covered with dirt or dust
As the focus is adjusted on the dirty glass, the subject behind the glass is out of focus. When recording a subject across a street on which cars are running, the focus may be adjusted on the cars.

❸ Recording subjects in dark surroundings
As the amount of light information entering through the lens is greatly reduced, the Movie Camera cannot adjust the focus precisely.

❹ Recording subjects surrounded by objects with shiny surfaces or much light reflection
As the Movie Camera adjusts the focus on objects with shiny surfaces or much light reflection, the subject may go out of focus.
Therefore, when recording at a lake or the sea, evening scenes, fireworks, or under special types of lighting, the subject may be out of focus.

❺ Recording fast-moving subjects
As the internal focusing lens is moved mechanically, it cannot follow fast-moving subjects without delay. Therefore, subjects like children running back and forth may temporarily go out of focus.

❻ Subjects with weak contrast
As the Movie Camera adjusts the focus based on vertical contours in the picture, subjects with little contrast such as a white wall may be out of focus.

■ White Balance Adjustment

While most recording with a Movie Camera is probably done outdoors under sunlight, video recording is also done very often under artificial light sources, both indoors and outdoors. However, each of these light sources gives the subject slightly different colours.

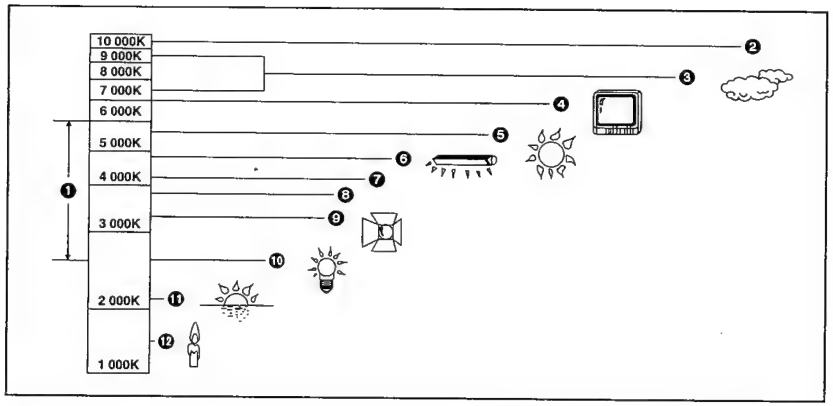
Human Eyes
Human eyes can easily adjust to different kinds of lighting and see an object with the same colours even under different lighting.

Movie Camera
Unlike human eyes, the Movie Camera does not have the innate ability to adapt to changes in lighting, and they influence the colours being recorded. Therefore, depending on the light source, the picture would be recorded with a bluish or reddish tint. To minimise the influence of the lighting on the colours of the subject, an adjustment called White Balance Adjustment is necessary.

White Balance Adjustment
The White Balance Adjustment determines the colour of the light and adjusts the colours so that white remains pure white. As white is the basic colour of the entire colour spectrum, if white is reproduced correctly, the other colours are correct and natural, too.

Auto White Balance Adjustment
This Movie Camera stores the optimum settings for several common light sources in memory. The Movie Camera judges the recording situation by determining the tint of the light received through the lens and by the White Balance Sensor **(→ 10)**, and it selects the setting for the most similar tint. This function is called Auto White Balance Adjustment.
However, as the white balance settings for only a few light sources are stored in memory, the white balance is not correctly adjusted for other lighting conditions.

For the range of different types of lighting within which the Auto White Balance Function can provide precise adjustment, refer to the chart **(→ 166)**. For recording under lighting conditions outside this range, the Auto White Balance Function does not work correctly, and the recorded picture has a red or blue cast. However, the same also applies, if the subject is lit by more than one light source, even if these light sources are within this range.



■ Colour Temperature

Every light source has its own colour temperature measured in Kelvin (K). The higher the Kelvin value, the more bluish the light; the lower the value, the more reddish the light. The Kelvin value is related to the tint of the light, but not directly to its brightness.
The range ❶ indicated in the illustration above shows the light sources for which this Movie Camera can provide precise white balance adjustment and, therefore, natural colours in the recorded pictures, when using the Full Auto Mode. For light sources outside this range, adjust the white balance manually **(→ 84)**. Also, additional lighting may be necessary.

❶ Control range of this Movie Camera's Auto White Balance Adjustment Mode
❷ Blue sky
❸ Cloudy sky (Rain)
❹ TV screen
❺ Sunlight
❻ White fluorescent lamp
❼ 2 hours after sunrise or before sunset
❽ 1 hour after sunrise or before sunset
❾ Halogen light bulb
❿ Incandescent light bulb
⓫ Sunrise or sunset
⓬ Candlelight

■ Time Code

Time Code signals are the data which indicates the time in hours, minutes, seconds and frames (25 frames/sec). Having this data included in the recording gives every single picture on the tape its own address.

- The Time Code is automatically recorded as part of the sub code with every recording you make.
- When you insert a new (previously unrecorded) cassette, the Time Code automatically starts from zero. If you insert a recorded cassette, the Time Code continues where the time code of the last previous scene stopped. (In this case, the zero indication [0h00m00s00f] may appear after inserting the cassette, but when the recording starts, the Time Code records from the previous value.)
- You cannot reset the Time Code to zero.
- In playback modes other than the Normal Playback Mode, the Time Code may not be displayed (or not be correct).
- Unless the Time Code is recorded continuously from the beginning of the tape, precise editing may not be possible. To ensure that the Time Code is recorded without interruption, we recommend that you use the Camera Search Function (➔ 58) or Blank Search Function (➔ 60) before starting to record a new scene.

■ Memory Stop Function

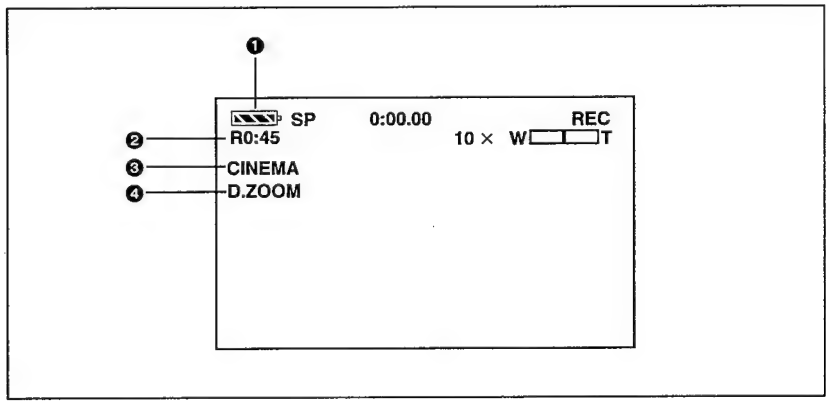
The Memory Stop Function is convenient for the following operations.

Rewinding or fast-forwarding the tape to a desired position

1. **Reset the Tape Counter to zero at the tape position from which you want to play back later. (➔ 100, 134)**
2. **Set [DISPLAY] on the [CAMERA MENU2] Menu or [VCR MENU2] Menu to [MEMORY].**
3. **Start playback or recording.**
4. After playback or recording is finished:
   Set the [POWER] Switch to [VCR].
5. **Rewind the tape.**
   The tape automatically stops approximately at the position at which you reset the counter to zero.

Stopping the editing automatically in the audio dubbing

1. **Reset the Tape Counter to zero at the tape position at which you want the editing to stop.**
2. **Set [DISPLAY] on the [CAMERA MENU2] Menu or [VCR MENU2] Menu to [MEMORY].**
3. **Play back a still picture at the point at which you want the audio dubbing to start.**
4. **Start the audio dubbing. (➔ 96)**
   The audio dubbing automatically stops approximately at the position at which you reset the counter to zero.



Indications on the LCD Monitor/in the Finder

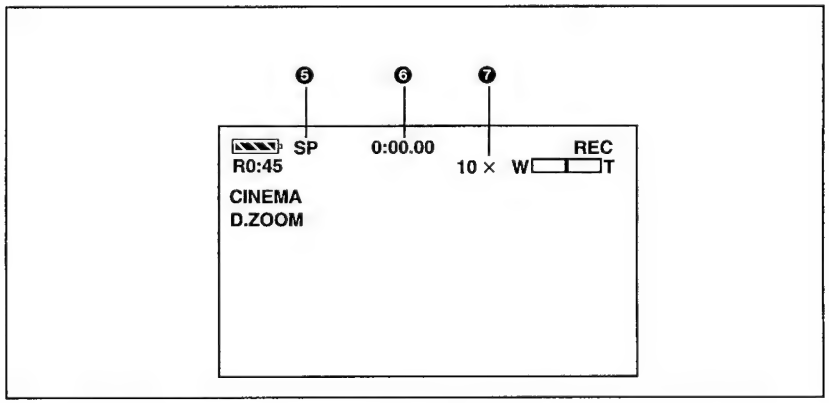
❶ Remaining Battery Power
As the remaining battery power decreases, the indication changes as follows:
→ → → →
When the battery is completely discharged, the ( ) Indication flashes.
(When you are using the AC Adaptor, the Indication may appear, however, this has no meaning in this case.)

❷ Remaining Tape Time
The remaining tape time is displayed in minutes. (When it becomes less than 3 minutes, the indication starts flashing.)
- If a recording lasts less than 15 seconds, the remaining tape time cannot be displayed correctly.
- The displayed remaining tape time may be shorter than the actual remaining tape time.

❸ Cinema Mode (➔ 42)
When recording in the Cinema Mode, this indication is displayed.

❹ Digital Zoom (➔ 38)
When the Digital Zoom Function is activated, this indication is displayed.

Digital Effects (➔ 74)
When a digital effect is activated, the corresponding indication is displayed.



❺ Recording Speed Mode (➔ 24)
The selected Recording Speed Mode is displayed.
SP: Standard Mode
LP: Long-play Mode

❻ Tape Counter, Time Code (➔ 176)
The Tape Counter, Memory Stop Function or Time Code Indication is displayed.

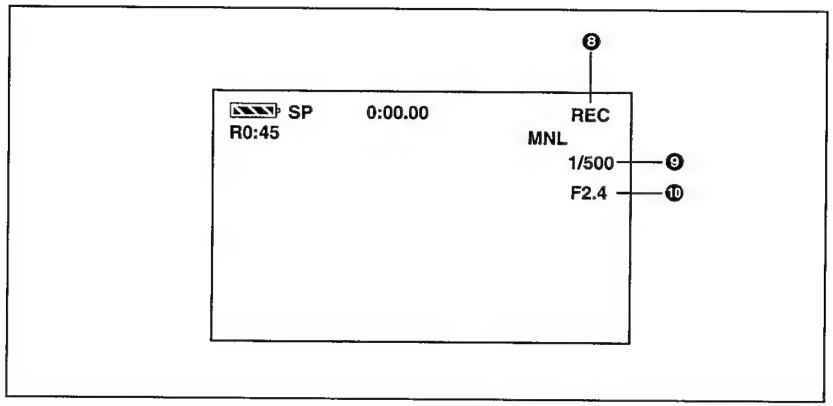
❼ Zoom Magnification (➔ 38)
When you push the [W/T] Zoom Lever up or down, the Zoom Magnification Indication and the Zoom Gauge are displayed.

Recording Mode (➔ 32, 82, 84, 86, 88, 90)
AUTO: This appears when the Mode Selector Switch is set to [AUTO].
MNL: This appears when the Mode Selector Switch is set to [MNL].

Super Image Stabilizer (➔ 44)
: When the Super Image Stabilizer Function is activated, this indication is displayed.

Audio Recording Mode (➔ 96)
12 bit/16 bit: The indication of the Audio Recording Mode that was selected for recording is displayed during playback.

Automatic Printing (➔ 122)
AUTOPRINT: This indication is displayed when the Auto Print Function is being used.



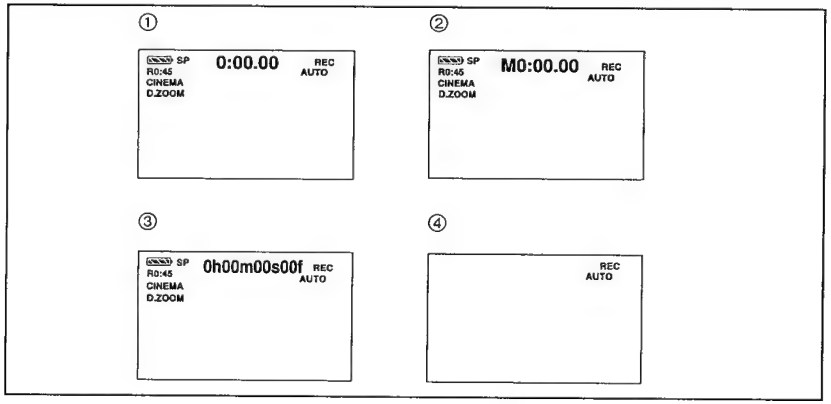
❽ Tape Run Indications

REC:	Recording (➔ 32)
PAUSE:	Recording Pause (➔ 32)
▷:	Playback (➔ 46)/Camera Search in forward direction (➔ 58)
◁:	Camera Search in reverse direction (➔ 58)
❚❚:	Still Playback (➔ 52)
▷▷:	Fast-forward/Cue Playback (➔ 48)
◁◁:	Rewind/Review Playback (➔ 48)
▮▷/◁▮:	Slow Playback in forward direction/ Slow Playback in reverse direction (➔ 50)
❚❚▷/◁❚❚:	Still Advance Playback in forward direction/Still Advance Playback in reverse direction (➔ 52)
▷▷▮/▮◁◁:	Index Search in forward direction/ Index Search in reverse direction (➔ 62, 64, 66)
CHK:	Recording Check (➔ 34)
A.DUB ▷:	Audio Dubbing (➔ 96)
A.DUB ❚❚:	Audio Dubbing Pause (➔ 96)
PHOTO:	Recording in the Photoshot Mode (➔ 40)
BLANK:	Blank Search (➔ 60)
R ▷:	Repeat Playback (➔ 46)

•When recording with the LCD Monitor facing forward using the Mirror Mode, only the Remaining Battery Power Indication, the Recording Indication [●] and the Recording Pause Indication [●❚❚] are displayed.

❾ Shutter Speed
When you manually adjust the shutter speed, this indication is displayed. (➔ 88)

❿ Iris Value (F Number)
When you manually adjust the iris, this indication is displayed. (➔ 90)



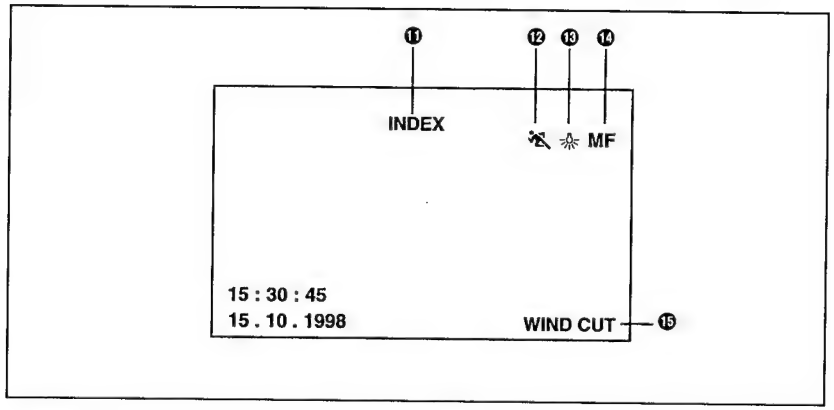
Changing the Indications
By changing the setting for [DISPLAY] on the [CAMERA MENU2] Menu or [VCR MENU2] Menu, or by repeatedly pressing the [DISPLAY] Button on the Remote Controller (➔ 100), the Counter Display Mode can be changed in the order shown in the above illustrations ①–④.

① Tape Counter Indication

② Tape Counter Indication with activated Memory Stop Indication

③ Time Code Indication

④ No Indication
(In this mode, only the Tape Run Indications, Warning/Alarm Indications, Date/Time Indications, Programme AE Mode Indications, Manual Focus Mode Indications, White Balance Mode Indications, and Zoom Magnification Indication can be displayed.)



⓫ Index (➔ 62)

INDEX:	The [INDEX] Indication flashes for a few seconds while an index signal is being recorded.

Search Number (➔ 66)

S1:	The figure indicates which number of scene ahead from the present scene is to be played back.

⓬ Programme AE Mode (➔ 70)
The Programme AE Function offers the following settings:

:	Sports Mode
:	Portrait Mode
:	Low Light Mode

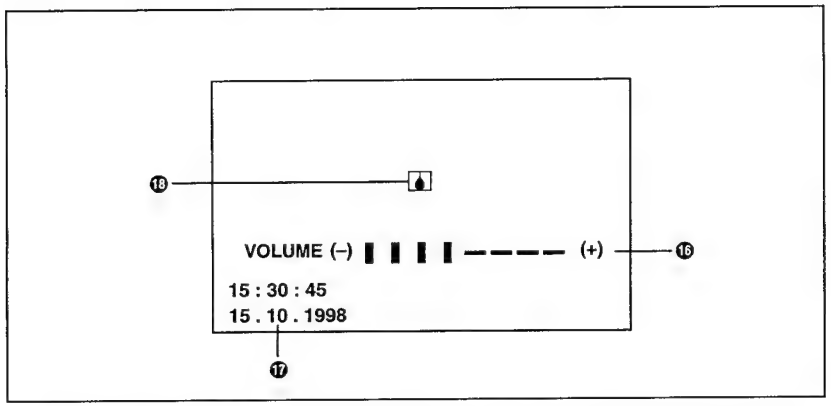
⓭ White Balance Mode (➔ 82)
The White Balance Mode offers the following possible settings:

:	Indoor Mode (recording under incandescent lamp)
:	Outdoor Mode
:	Last manually adjusted White Balance setting

When the Movie Camera is in the Auto Mode, none of the above 3 indications are displayed.

⓮ Manual Focus (➔ 86)
If you select the Manual Focus Mode, the [MF] Indication is displayed.

⓯ Wind Noise Reduction [WIND CUT]
If you set [WIND CUT] on the [CAMERA MENU2] Menu to [ON], the [WIND CUT] Indication is displayed.



⓰ Sound Volume (➜ 46)
Use this indication to adjust the volume of the playback sound from the built-in speaker.
Set the [POWER] Switch to [VCR] and keep the [PUSH] Dial pressed until the [VOLUME] Indication appears.Then turn the [PUSH] Dial to adjust the volume.

⓱ Date and Time (➜ 46)
The time is indicated in the 24-hour system.

⓲ Warning/Alarm
When any of the following indications lights or flashes, confirm the condition of the Movie Camera.

- : Condensation has occurred. **(➜ 148)**
- : The erasure prevention slider of the inserted cassette is open (set to [SAVE]).
  No cassette is inserted.
- : The built-in battery is discharged. **(➜ 140)**
- : The video heads are dirty.
- END: During recording, the tape has reached its end.
- REMOTE: Wrong Remote Controller Mode is selected. **(➜ 110)**
- PRINTER ERROR: This indication is displayed if you set [AUTOPRINT] on the [VCR MENU2] Menu to [ON] when no printer is connected to the Movie Camera. **(➜ 122)**

Before Requesting Service (Problems & Solutions)

Power Supply

P1: The Movie Camera does not turn on.
S1: Is the Battery or the AC Adaptor connected correctly? Confirm the connection. **(➜ 16)**

P2: The Movie Camera has turned off automatically.
S2: If you leave the Movie Camera in the Recording Pause Mode for more than 6 minutes, it automatically switches off to protect the tape and to conserve battery power. **(➜ 32)**

P3: The Movie Camera quickly turns off.
S3-1: Is the Battery discharged? When the Remaining Battery Power Indication is flashing or the [▭] Indication is displayed, the Battery is discharged. Charge the Battery or attach a fully charged Battery. **(➜ 18, 170)**
S3-2: Has condensation formed? If the Movie Camera is brought from a cold to a warm place, condensation may form inside. In this case, the Movie Camera automatically switches off and no operation can be performed except taking out the cassette. Wait until the Condensation Indication disappears. **(➜ 148)**

Battery

P1: The Battery discharges quickly.
S1-1: Is the Battery fully charged? Charge it until all 3 Charge Lamps on the AC Adaptor light. **(➜ 18)**
S1-2: Are you using the Battery in a place where the temperature is very low? The ambient temperature greatly influences the Battery's performance. Its operation time becomes shorter in a cold place. **(➜ 152)**
S1-3: Has the Battery reached the end of its service life? The service life of the Battery is limited. It depends on the way the Battery is used, but when the operation time even after proper charging is too short for normal use, the service life of the Battery has reached its end.

P2: The Battery cannot be charged.
S2: If the DC Input Cable is connected to the AC Adaptor, charging is not possible. Disconnect the DC Input Cable.

Normal Recording

P1: Recording cannot be started even though the Movie Camera is supplied with power and the cassette is inserted correctly.
S1-1: Is the erasure prevention slider of the cassette open? If it is open (set to [SAVE]), recording is not possible. **(➜ 22)**
S1-2: Has the tape reached its end? Insert a new cassette. **(➜ 22)**
S1-3: Is the Movie Camera turned on? **(➜ 32)**
S1-4: Is the [POWER] Switch set to [CAMERA]? When it is set to [VCR], recording is not possible. **(➜ 32)**
S1-5: Is the Condensation Indication [] displayed? When condensation has formed, no functions except taking out the cassette can be operated. Wait until the Condensation Indication disappears. **(➜ 148)**

Other Recording

P1: The picture on the LCD Monitor/in the Finder suddenly stands still for a few seconds.
S1: Did you press the [PHOTO SHOT] Button? If you press the [PHOTO SHOT] Button, a still picture is recorded for approximately 7 seconds. After approximately 7 seconds, the Movie Camera switches back to the Recording Pause Mode. **(➜ 40)**

P2: The Auto Focus Function does not work.
S2-1: Is the Manual Focus Mode selected? If you select the Auto Focus Mode, the focus is adjusted automatically. **(➜ 86)**
S2-2: Is the subject or recording situation suitable for the Auto Focus Mode? The Auto Focus Function does not work correctly for some kinds of subjects and recording situations. In this case, use the Manual Focus Mode to adjust the focus. **(➜ 86)**

Editing

P1: Audio dubbing cannot be performed.
S1-1: Is the erasure prevention slider of the cassette open? If it is open (set to [SAVE]), editing is not possible. **(➜ 22)**
S1-2: Are you trying to edit parts of the tape recorded in the LP Mode? As the tracks recorded in the LP Mode are narrower than the heads, audio dubbing is not possible. **(➜ 24, 96)**

Indications

P1: The Time Code becomes incorrect.
S1: In the Slow Motion Playback Mode in reverse direction, the counter of the Time Code Indication may not be stable, however, this is not a malfunction.

P2: The Remaining Tape Time Indication disappears.
S2: If you record a still picture in the Photoshot Mode, the Remaining Tape Time indication may disappear temporarily. However, if you switch the Movie Camera over to the Normal Recording Mode, it appears again.

P3: The Remaining Tape Time Indication does not match the actual remaining tape time.
S3-1: If scenes of less than 15 seconds are recorded successively, the remaining tape time is not indicated correctly.
S3-2: The Remaining Tape Time Indication may show a remaining tape time that is 2–3 minutes shorter than the actual remaining tape time.

Playback (Picture)

P1: No playback picture is reproduced when pressing the Play Button [▶].
S1: Is the [POWER] Switch set to [VCR]? When it is set to [CAMERA], no playback function can be operated. (➔ 46)

P2: Mosaic-like patterns appear in the picture during Cue, Review or Slow Motion Playback.
S2: This phenomenon is a characteristic of the digital video system. This is not a malfunction. (➔ 48)

P3: I want to play back the picture on a TV.
S3: Attach the Output Terminal Box [AV ONE TOUCH STATION] to the Movie Camera and use the AV Cable (PHONO-PHONO) to connect it to the TV. Or use the AV Cable (PHONO-M3) to connect the Movie Camera directly to the TV. (➔ 54)

P4: The Movie Camera is correctly connected to a TV, but no playback picture is reproduced.
S4: Did you select "Video Input" on the TV? Carefully read the operating instructions for your TV and select the channel that matches the input sockets used for connection.

P5: The playback picture is not reproduced clearly.
S5: Are the video heads on the Movie Camera dirty? If the video heads are dirty, the picture cannot be played back clearly. (➔ 150)

Playback (Sound)

P1: No sound is played back from the Movie Camera's built-in speaker.
S1: Is the volume set too low? During playback, keep the [PUSH] Dial pressed until the [VOLUME] Indication appears. Then turn the [PUSH] Dial to adjust the volume. (➔ 46)

P2: Different sounds are played back together.
S2: [12bit AUDIO] on the [VCR MENU1] Menu is set to [MIX]. Therefore, the original sound and the sound dubbed with audio dubbing are played back together. It is also possible to play them back individually. (➔ 98)

P3: The original sound was erased by performing audio dubbing.
S3: If you perform audio dubbing on a recording made in the [16bit] Mode (➔ 96), the original sound is erased. If you want to keep the original sound, be sure to select the [12bit] Mode for the original recording.

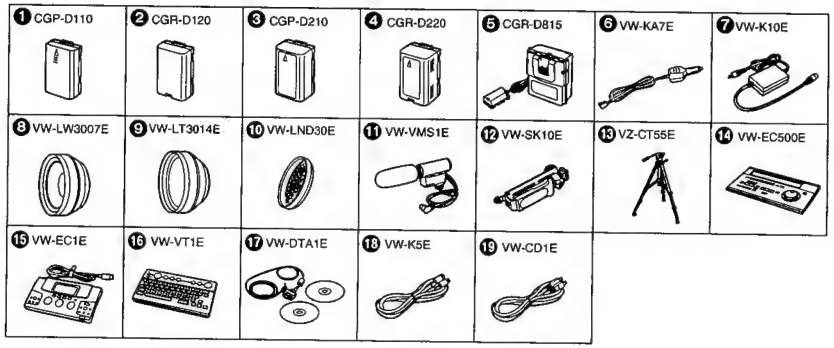
P4: **No playback sound is reproduced.**
S4-1: Are you playing back a cassette that was recorded with [AUDIO REC] on the [CAMERA MENU2] Menu set to [12bit]? In this case, make sure that [12bit AUDIO] on the [VCR MENU1] Menu is set to [ST1] (➔ 98).
S4-2: Is the Variable Speed Search Function activated? Press the Play Button [▶] to cancel the Variable Speed Search Function (➔ 48).

Others

P1: The cassette cannot be taken out.
S1-1: Is the Movie Camera supplied with power? Is the AC Adaptor correctly connected or the Battery correctly attached? To remove the cassette, the Movie Camera must be supplied with power, however, it is not necessary to set the [POWER] Switch to [CAMERA] or [VCR].
S1-2: The attached Battery may be discharged. Replace it with a charged Battery.

P2: No operation except taking out the cassette can be performed.
S2: Is the Condensation Indication [▲] displayed? If condensation has formed inside the Movie Camera, it automatically switches off and prevents all operations except taking out the cassette. Wait until the Condensation Indication disappears. (➔ 148)

P3: The Remote Controller does not work.
S3-1: Is the button-type battery in the Remote Controller exhausted? If the Remote Controller does not work when you use it near the Remote Controller Sensor on the Movie Camera, the button-type battery is exhausted. Replace it with a new battery. (➔ 108)
S3-2: Is the correct Remote Controller Mode selected? If the Movie Camera's setting for [REMOTE] on the Menu and the mode selected on the Remote Controller are not matched, operating the Movie Camera with the Remote Controller is not possible and the [REMOTE] Indication is displayed. (➔ 110)



Optional Accessories

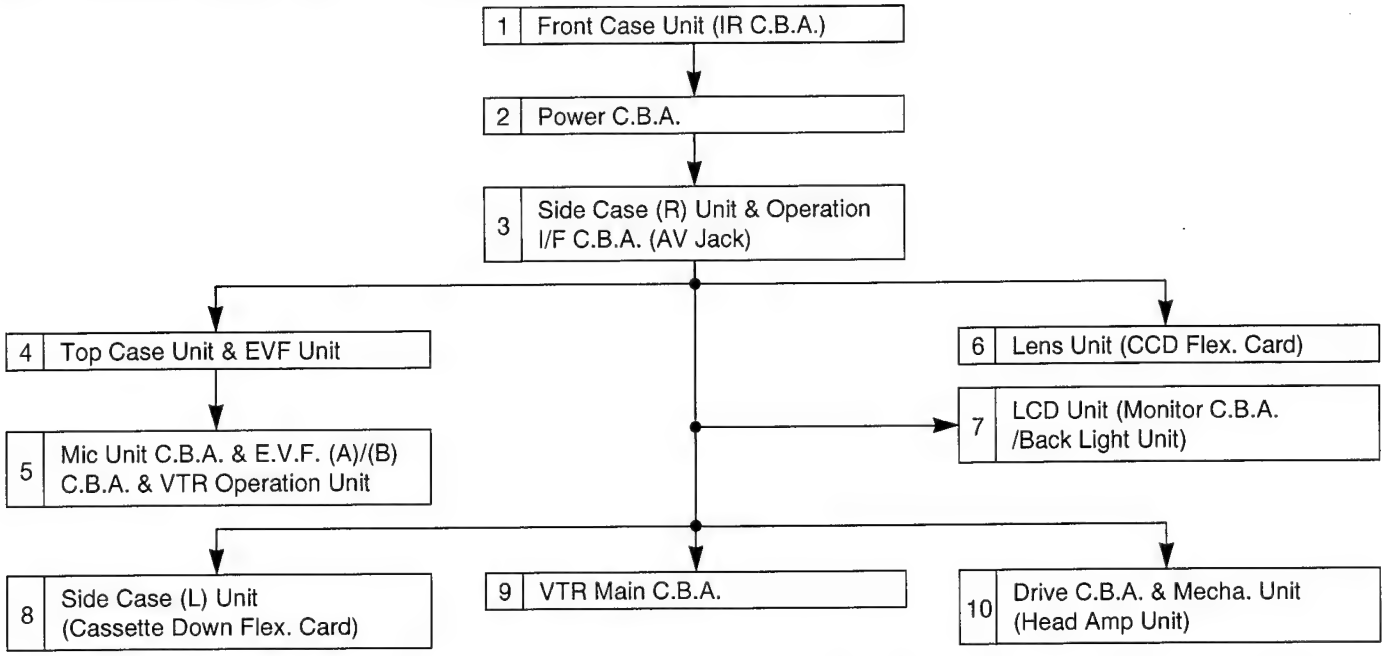
❶ Battery Pack (Lithium)
❷ Battery Pack (Lithium)
❸ Battery Pack (Lithium)
❹ Battery Pack (Lithium)
❺ Battery Pack (Lithium)
❻ Car Adaptor Cord
❼ 5-Pin Synchro Cord
❽ Wide Conversion Lens
❾ Tele Conversion Lens
❿ ND Filter
⓫ Stereo Zoom Microphone
⓬ Shoe Adaptor
⓭ Tripod
⓮ Editing Controller
⓯ Editing Controller
⓰ Video Titler
⓱ Personal Computer Connection Kit
⓲ Edit Cable
⓳ DV Cable

•Some accessories are not available in some countries.

SECTION 2
ADJUSTMENT PROCEDURES

2-1. DISASSEMBLE FLOW CHART

This flow chart indicates the disassembly steps the cabinet parts, C.B.A. and Mechanism Unit in order to access to items to be serviced. When reinstalling, perform the steps in the reverse order.



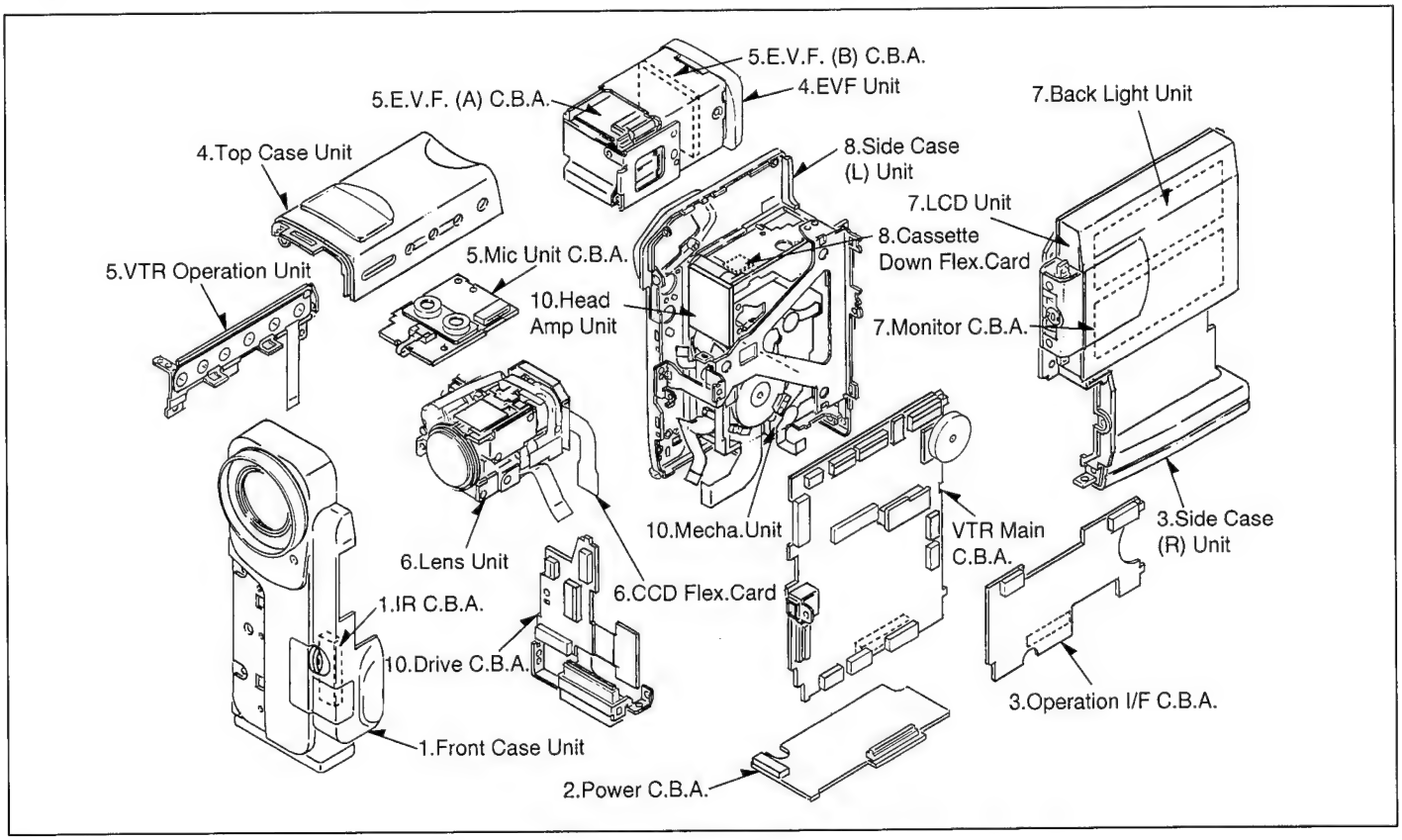


Fig. F1

2-2. DISASSEMBLY PROCEDURES

Flow-chart Disassembly procedure

No.	Item / Part	Fig.	Removal (Screw & Other)
(1)	Front Case Unit	Fig. 1	2-Screws (A) Unlock---Locking Tabs Remove the Grip Cover. 7-Screws (B/C/D/E) Disconnect FP6304. Remove the Front Case Unit.
(2)	Power C.B.A.	Fig. 2	2-Screws (F) Unlock---Locking Tab Remove the Bottom Case Unit. Disconnect PS1001/FP1001.
(3)	Side Case (R) Unit & Operation I/F C.B.A.	Fig. 3-1 Fig. 3-2	8-Screws (G/H/I/J) Disconnect FP601/FP602/FP3301. Remove the Side Case (R) Unit. Disconnect FP6702/PP3401/FP6302. Remove the Operation I/F C.B.A.
(4)	Top Case Unit & EVF Unit	Fig. 4	2-Screws (K/L) Disconect FP4201/FP801.
(5)	Mic Unit C.B.A. & E.V.F. (A)/(B) & VTR Operation Unit	Fig. 5	1-Screw (M) 2-Screws (N) Unlock---Locking Tabs Remove the Mic Unit C.B.A. & E.V.F. (A)/(B) C.B.A. & VTR Operation Unit.
(6)	Lens Unit	Fig. 6	1-Screw (O) Disconnect PS201/FP701. Remove the Lens Unit.
(7)	LCD Unit	Fig. 7	3-Screws (P) Remove the LCD Top Case Unit. 1-Screw (Q) Remove the LCD Flex. Fixing Piece. Disconnect the FP905 & remove the Hall Sensor Flex. Card. Disconnect the FP901/FP902/FP903 and FP904. Unlock---Locking Tab Remove the Monitor C.B.A.
(8)	Side Case (L) Unit	Fig. 8	4-Screws (R/S) Disconnect FP6001/FP6303. Unlock---Locking Tabs Remove the Side Case (L) Unit.
(9)	VTR Main C.B.A.	Fig. 9	Disconnect FP2204/PS2001/FP3201. Unlock---Locking Tabs Remove the VTR Main C.B.A.
(10)	Drive C.B.A. & Mecha. Unit	Fig. 10	1-Screw (T) Disconnect FP2201/FP2202/FP2203. Unlock---Locking Tabs Remove the Drive C.B.A. 3-Screws (U) Remove the Mecha. Unit.

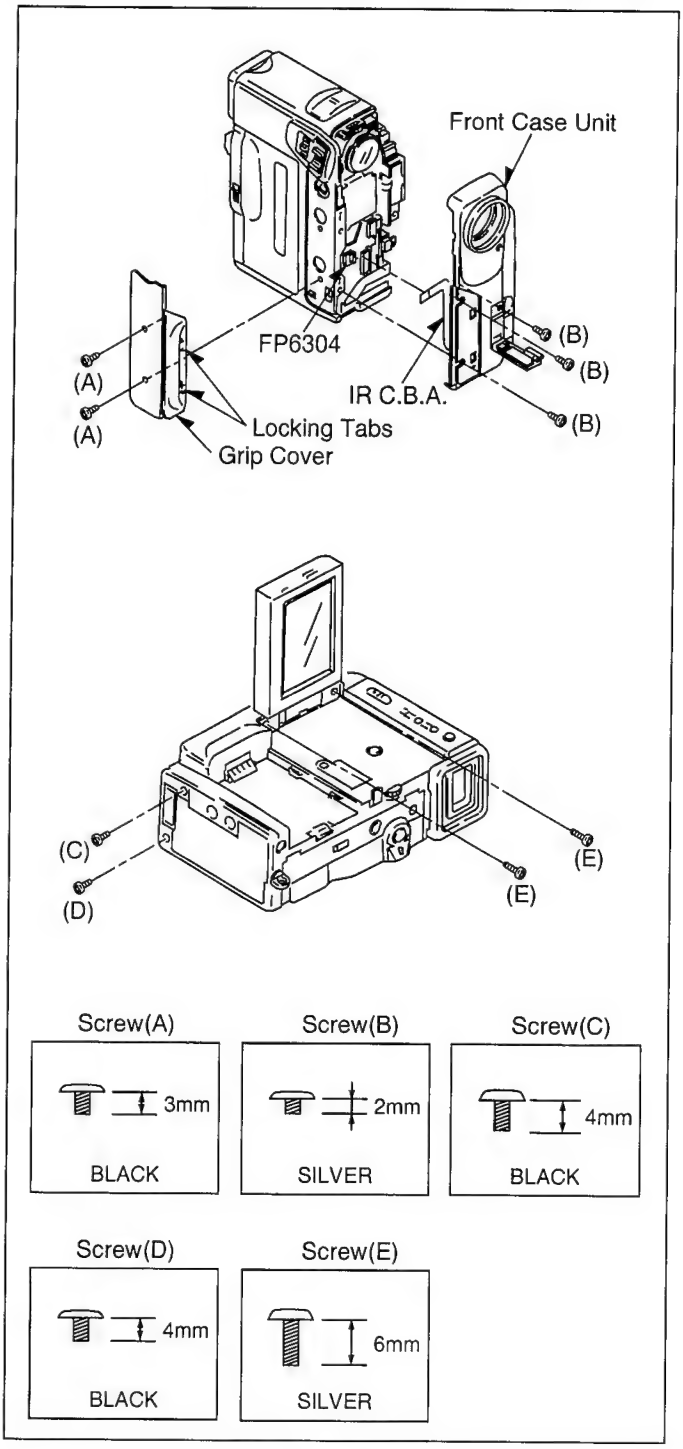


Fig. 1

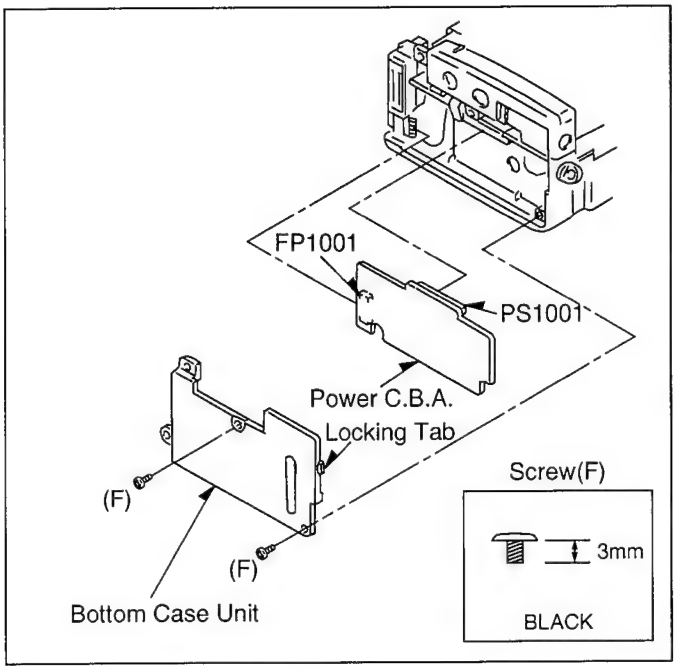


Fig. 2

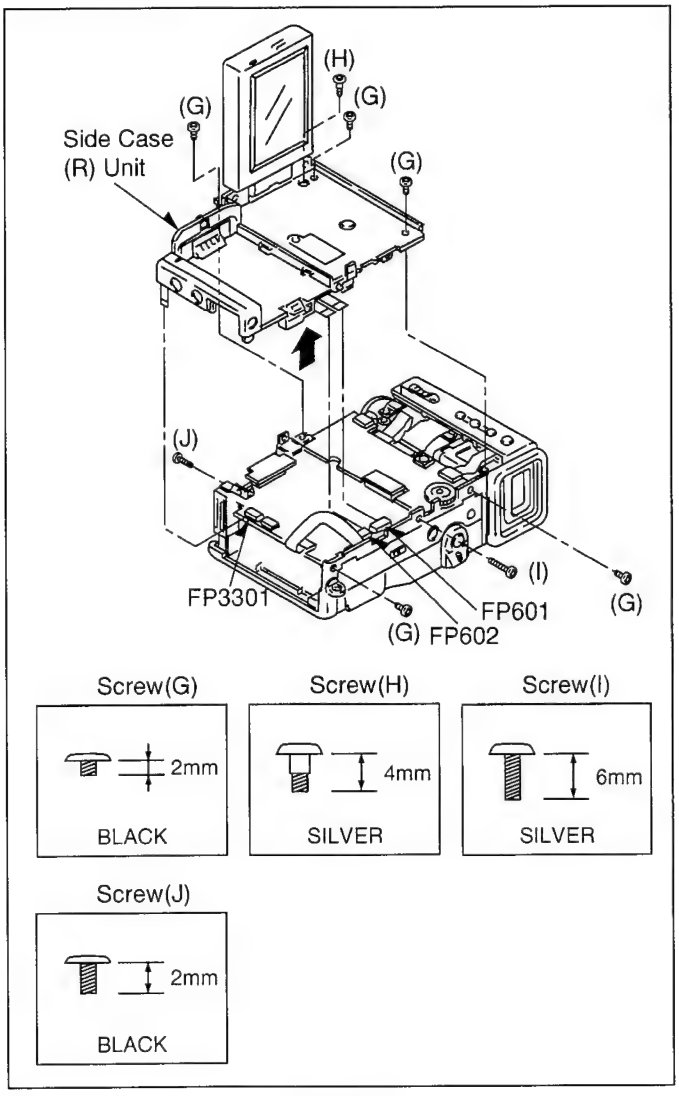


Fig. 3-1

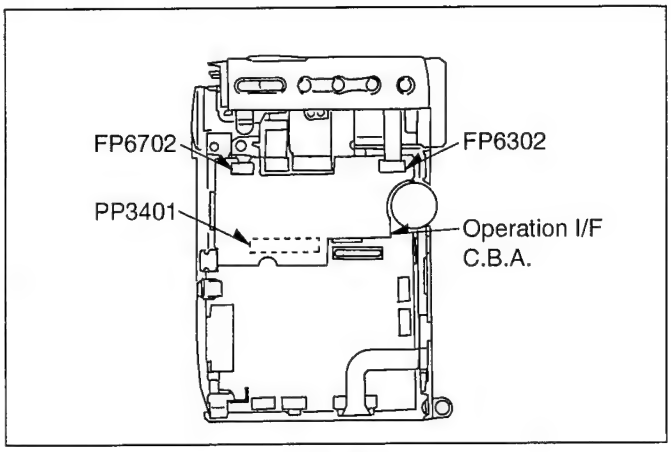


Fig. 3-2

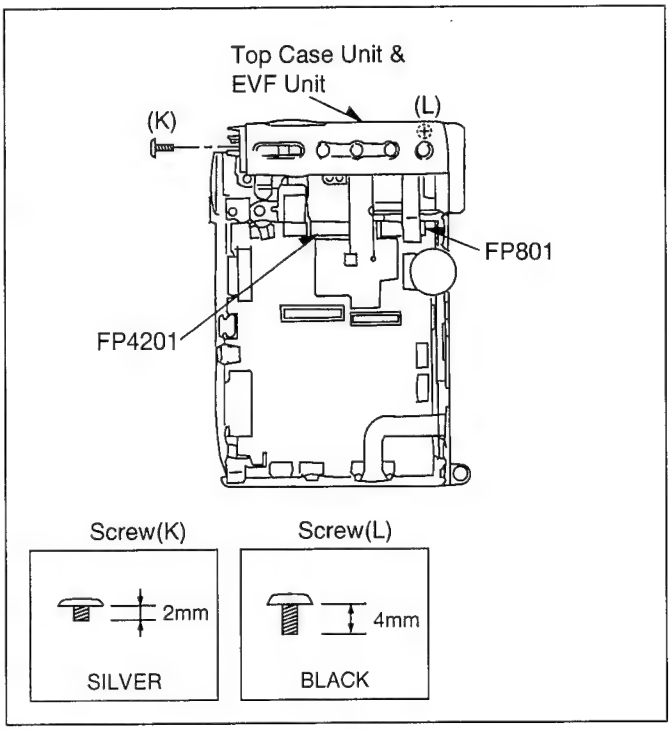


Fig. 4

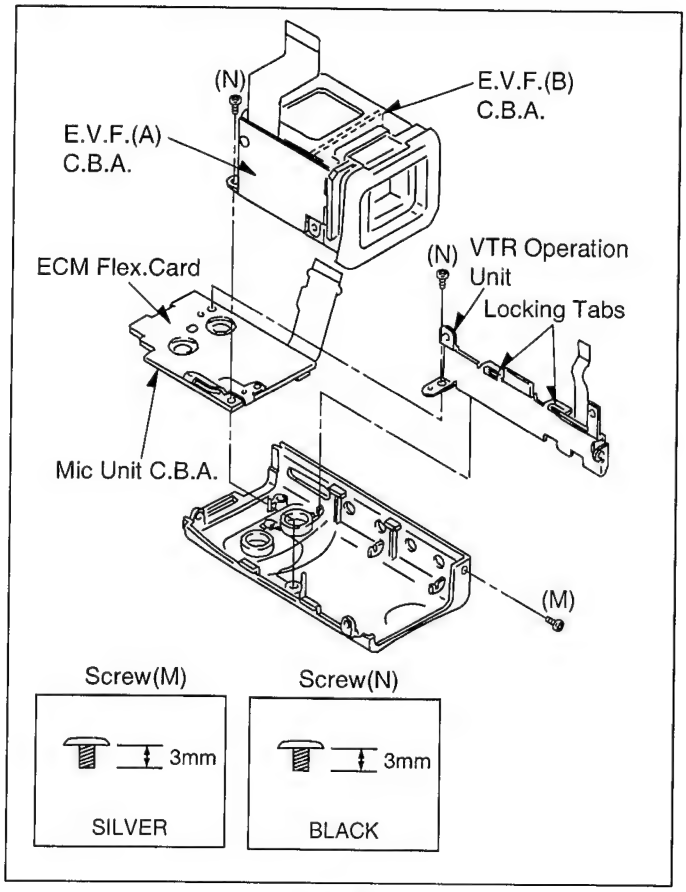


Fig. 5

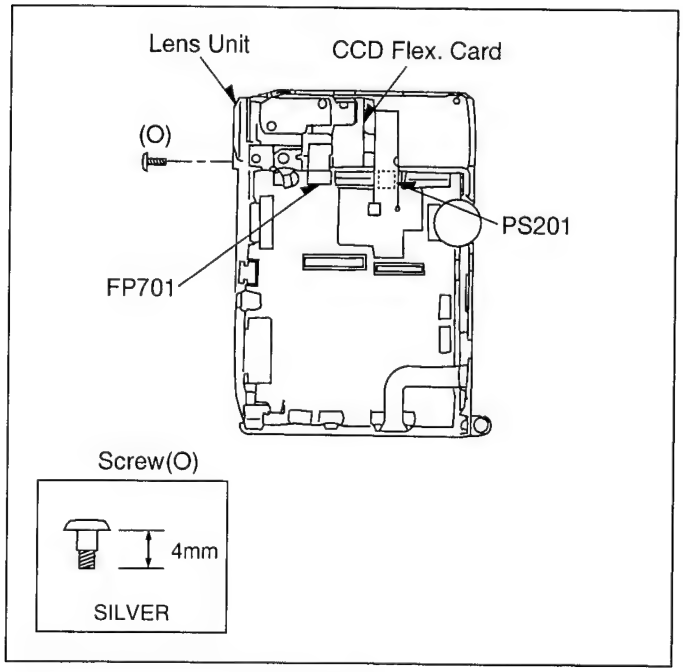


Fig. 6

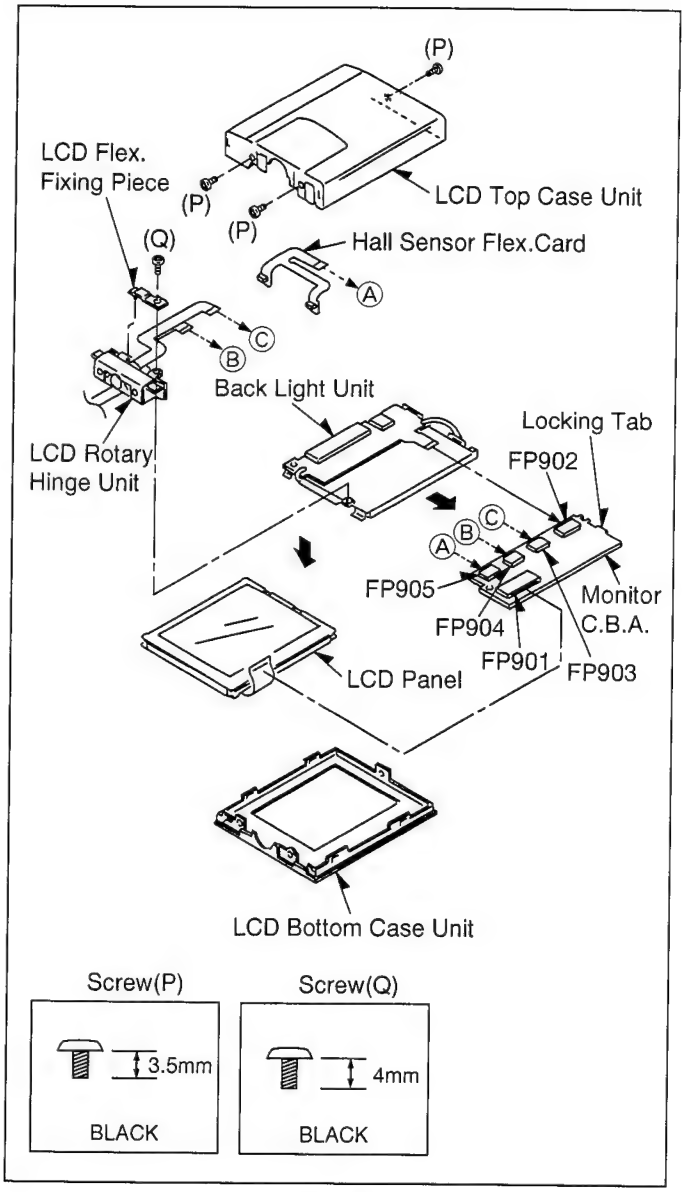


Fig. 7

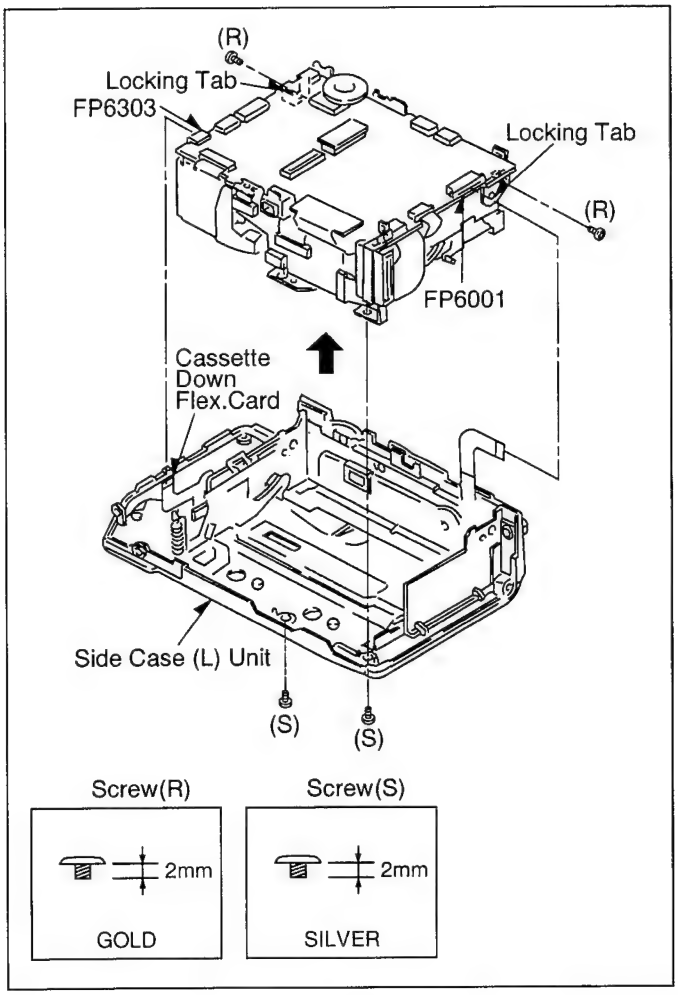


Fig. 8

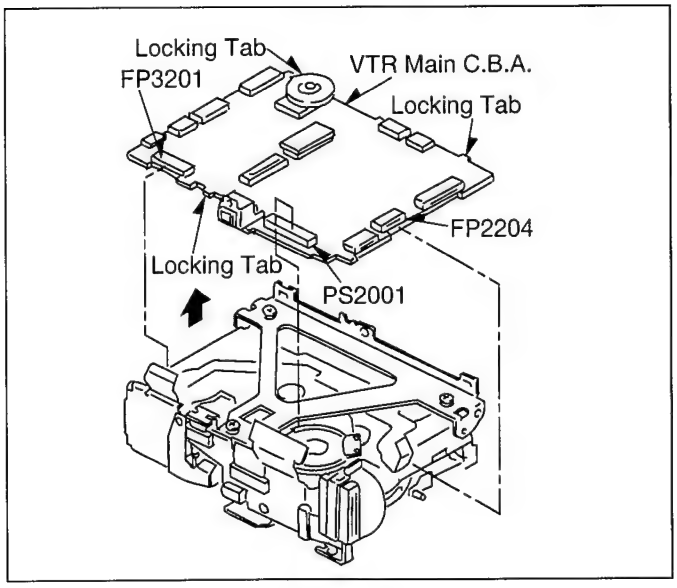


Fig. 9

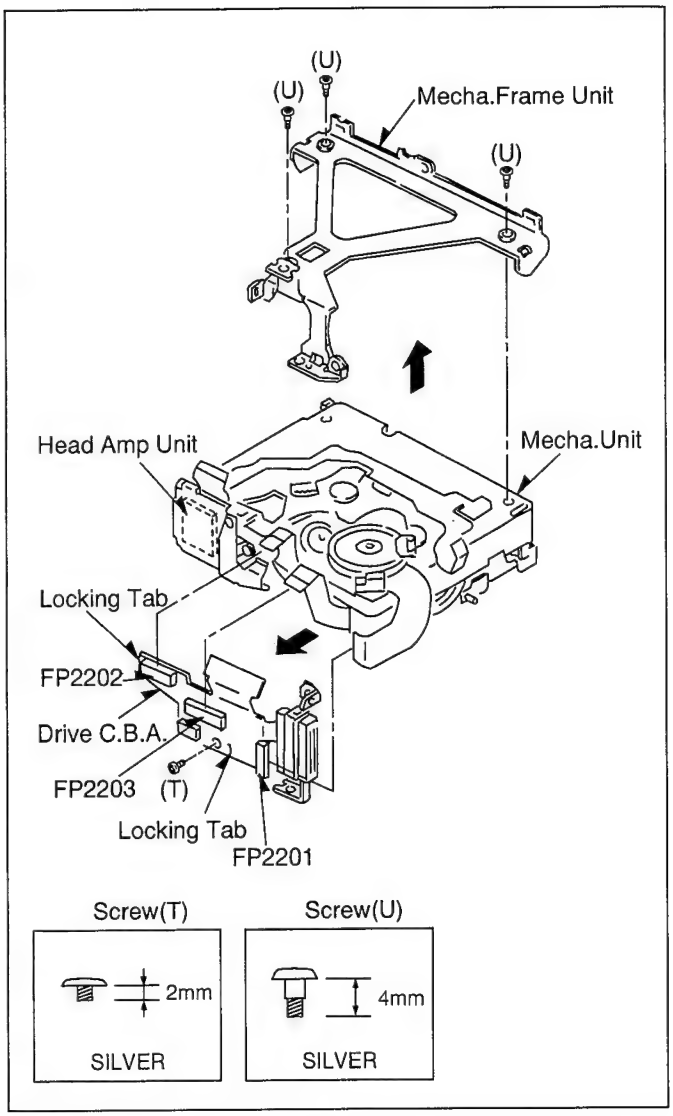


Fig. 10

2-3. DISASSEMBLY PROCEDURES OF LENS UNIT

The following flowchart describes order or steps for removing the lens units and certain printed circuit boards in order to make access to the item needing service.
To reassemble the unit follow the steps in reverse order.

1. CCD Unit	Ref.No. 302
2. CCD Cushion & Crystal Filter	Ref.No. 303/301
3. Lens Flex. / Z.Motor/Iris	Ref.No. 304-1/304-2/304-10
4. Main Frame U.	Ref.-No. 304-8
5. 4th Moving Frame U. / Guide Pole	Ref.-No. 304-7/304-4/304-5
6. 3rd Lens Frame U.	Ref.-No. 304-9
7. 2nd Moving Frame U.	Ref.-No. 304-6

Note :
Each Ref.-numbers are equivalent to number on Fig. L2 and Parts-List.

Fig. L1

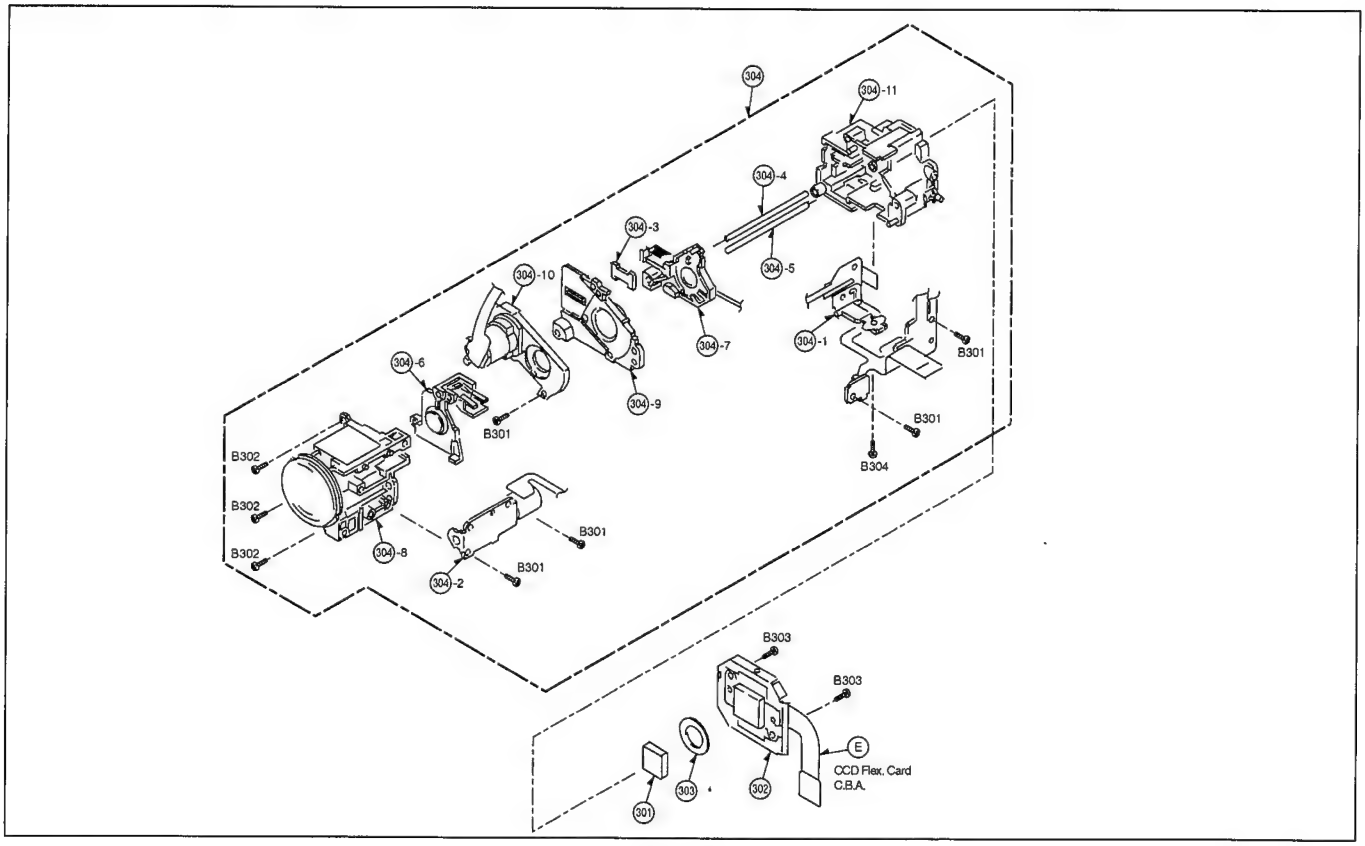


Fig. L2

SECTION 3
BLOCK DIAGRAMS & SCHEMATIC DIAGRAMS

3-1. ABBREVIATIONS

	INITIAL/LOGO	ABBREVIATIONS
A	A GND	Analogue GND
	A HASW	Audio Head Amp Switching Pulse
	A HSW	Audio Switching Pulse
	A MUTE	Audio Mute
	A ORP	Audio Overlap Pulse
	A. TR	Auto Tracking
	A0-8, 0-17	Memory Address
	A3V2	AD Converter Reference Voltage
	AB0-4	Address Bus
	AB0-4, AB12-15	Address Bus Line 0-4, 12-15
	ABSF	Focus Encoder Input
	ACI	Analogue Channel Cording IC
	AD	AD Converter
	AD	Auto Date, Analogue Digital Converter
	AD CLK	AD Clock
	AD REC	Audio Delayed REC
	AD0-6	Address
	AD0-6, ADR0-6	Address Data Line
	ADCLK	Analogue Digital Converter Clock
	ADCNT	Analogue Digital Control
	ADCS	Analogue Digital Chip Select
	A-DET	Audio Detect
	ADREC	Audio Delaied Rec
	ADUB	Audio Dubbing
	AE	Auto Expose
	AECNT	Auto Expose Control
	AEE(H)	Audio E-E (H)
	AEH	Audio Erase Head
	AEIRQ	Auto Expose Interrupt Request
	AF/MF	Auto Focus/Manual Focus
	AF DIS CS	AF DIS Chip Select
	A-FADE(L)	Audio Fade (L)
	AF-AMP	AF HALL Bias
	AFCS	Auto Focus Chip Select
	AFRP	Audio PLL Voltage Control
	AF-VN	Zoom Encoder V-Ref (–)
	AF-VP	Zoom Encoder VREF (+)
	AGC	Automatic Gain Control
	AGCCNT	Automatic Gain Control Control
	AGND	Analogue Ground/Audio Ground
	AGS	Anti Ground Shooting
	AH(P) / (R)	Audio Head (Play) / (Record)
	AHASW	Audio Head Amp Switch Pulse
	AHSW	Audio Head Switch Pulse
	AI, AO	Buffer Input, Output
	AIBCK	Bit Clock (to A/D Converter)
	AIDAT	Serial Data (to A/D Converter)
	AILRCK	L/R Clock (to A/D Converter)
	AIMCK	Master Clock (to A/D Converter)
	ALC CNT	Auto Level Control Control
	ALC MAIN	Auto Level Control Drive
	ALE	Address Latch Enable
	A-LOCK	Full Auto Switch
	A-MUT(H)	Audio Mute (H)
	ANLPTH	Analogue Loop Through High
	AORP	Audio Overlap Pulse
	APCNT	Aperture Control
	APS	Auto Power Save
	ART VH	Artifical Vertical Sync
	AT CNT	Automatic Tracking Gain Adjust
	ATF	Automatic Track Finding
	ATFCLK	41.85MHz Clock
	ATFG	Auto Track Gain
	ATL	Auto Lock Select
	ATN	Absolute Track Number
	ATR OFF(H)	Auto Tracking Off (H)
	ATV	Advanced TV
	AUDIO(N)	Audio (Normal)
	AUX	Auxiliary
	AVDD	Analogue VDD
	AVSS	Analogue Ground
	AWTB	Auto White Balance B-Y
	AWTR	Auto White Balance R-Y
B	BACK	Back-up
	BACK UP	Microcomputer Back-up
	BACK VDD	Back-up Power
	BATT	Battery
	BATT ALARM	Battery Alarm
	BATT REF	Reference Voltage for Battery
	BCB	B Carrier Balance
	BCBM(B-Y)	B-Y Carrier Balance
	BCBM(R-Y)	R-Y Carrier Balance
	BD0-7	REC/Play In/Out Buss
	BDCK	Standard Bus Data Clock (9MHz)
	BDEN	Standard Bus Data Enable
	BEND	Data Block End Request
	BF	Burst Flag Pulse
	BFA	Burst Flag Pulse for Encorder
	BFO/BFI	Burst Flug Input/Output
	BI, BO	Buffer Input, Output
	BL	Back Light
	BL ON	Back Light ON (L)
	BL4V	Back Light 4V
	BLC 0, 1	Back Light Y Control Out, In
	BLDI/O	Back Light Drive Input/Output
	BLK	Blanking Pulse
	BLKA	Blanking for Encorder
	BLKA	Blanking Pulse for Encorder
	BLKI/O	Blanking Pulse In/Out

	INITIAL/LOGO	ABBREVIATIONS
	BLKZ	Blanking Pulse for Zoom Encorder
	BM	Balance Modulator
	BQUIET	Bus Out Control Signal
	BUF IN/OUT	Buffer In/Out
	B-Y KB	B-Y Carrier Balance
	B-YO	B-Y Signal Out
C	C A In/Out	Pre-Aperture In/Out
	CAPSTP	Capstan Stop Flag
	C CNT	Colour Control
	C SYNC	Composite Sync Signal
	C/N	Carrier/Noise
	C0-7, C00-07	Chrominance Signal 0-7
	CAGAIN	Aperture Gain Control
	CAM	Camera
	CAM CLK	Camera Clock
	CAM RST	Camera Reset
	CAM SIOC	Camera Serial In/Out Contol
	CAM T	Camera Test
	CAM TL	Capstan Trque Limit
	CAP EC	Capstan Trque Control
	CAP P(H)	Capstan Power On (H)
	CAP R/F/S	Capstan Reverse (H)/Stop (M)/Forward (L)
	CAP SW	Capstan Power Control Switch
	CAPSTP H	Capstan Stop Flag (Stop High)
	CAPVM	Capstan Motor Current
	CAPVS	Capstan Motor Power Control Switch
	CAS	Compresion, Audio Process, Shuffling/Deshuffling
	CAS	Memory Address Strobe (Active Low)
	CASDOWN, DWN	Cassette Down (L)
	CB, CR	Chroma B, Chroma R
	CBLK	Composite Blanking Pulse
	CC	Channel Cording
	CCA	Curent Drive Control
	CCA	Current Control Amp
	CCD	Charge Coupled Devise
	CCW	Counterclockwise
	CD SP0-7	Digital Chroma
	CDS	Correlate Double Sampling Signal
	CDS1, 2	Sampling Pulse for CCD Output Signal
	CE	Chip Enable
	CE	Control Pulse Erase
	CEC	Capstan Error Code
	C-ERA(H)	Control Erase (H)
	CFEM	Chrominance Memory Signal
	CFM	Chrominance Field Memory
	CFM1-4	Chroma Field Memory Signal
	CG CLK	Character Generator Clock
	CG CLK DATA	Clock Generator Data
	CG DATA	Character Generator Data
	CGC	Chrominance Gain Control
	CGCS	Character Generator Chip Select
	CGO	Character Generator Serial Data
	CH	Charge

	INITIAL/LOGO	ABBREVIATIONS
	CH1	Channel 1 (Odd Field)
	CHR	Character
	CHR BACK	Character Back-up
	CHR MIX	Character Mix
	CI, CO	Buffer In/Out
	CI,CO	Buffer Input & Output
	CIF	Control Signal Forward Input
	CIF, CIR	Positive Control Pulse, Negative Control Pulse
	CIR	Control Signal Reverse Input
	CK	Clock
	CL/CLK	Clock
	CLASS	Classeffication Signal for Compress (DCT/VLC)
	CLASS 0.1	Class Control Signal Durring DCT/VLC
	CLK135	13.5MHz System Clock
	CLK18	18MHz System Clock
	CLK2	Clock 2 (824XFH: 12.875MHz)
	CLK246	24.576MHz Clock
	CLK27	27MHz System Clock
	CLK450	450KHz Clock
	CLKDCLK	Digital Clock
	CLK-PH	Clock Phase Control
	CLK-REF	Reference Clock
	CLP-RST-H	Clamp Reset High Signal
	CLX	TFT X-axis Transmission Clock
	CLX, CLX1-4	Shift Clock for X Direction (LCD Panel)
	CLY	Shift Clock for Y Direction (LCD Panel)
	CLY	TFT Y-axis Transmission Clock
	CLY FG	Cylinder FG Signal
	CMEMO0-3	Chroma Memory Output Signal 0-3
	CMIX	Character Mix
	CMO	Chrominance Memory Output
	COMPC	Position Detection Pulse
	COM RDY	Serial Enable Signal
	CMODE	Camera Mode
	CNCLK	Clock
	CNR	Chrominance Noise Reduction
	CNT, CONT	Control
	CO	Control Out
	CO0-7	Chrominance Output 0 to 7 (Digital)
	COM	Common
	COM RDY	Serial Transmission Enable
	COMB	Comb Filter
	COS EQ	Cosin Equalizer
	CP	Clamp Pulse
	CP ON(H)	Camera Power On(H)
	CP2, 20	Clamp Pulse
	CP2A, CP2O	Encoder Clamp Pulse
	CPN	Component Signal
	CPOB	Clamp Pulse for Optical Blanking
	CPS	Composite Signal
	CPV	Gate Scan Clock
	CR OUT	Pre Apature Out
	CR POW SW	Camera Remote Power On Switch
	CRA	Aperture Gain Control

	INITIAL/LOGO	ABBREVIATIONS
	CRA	Pre Apature Gain Control
	CRST	Camera Reset
	CS	Chip Select
	CS 0-7	Chrominance Signal Out 0-7
	CSEL	Clock Phase Select
	CSI 0-7	Chrominance Signal In 0-7
	CTSW	Crosstalk Switch
	CURR	Current
	CW	Clockwise
	CYL EC	Cylinder Motor Trque Control
	CYL PG	Cylinder Motor PG
	CYL VM	Cylinder Motor Current or Power
D	D CLK	Digital Clock
	D MODE	Digital Mode Switch Signal
	D01-03	Zoom 01-03
	DA UV SEL	D/A Convertor U/V Select
	DAC	Digital Analogue Converter
	DAG	Digital Analogue Ground
	DB0-7	Data 0-7
	DB0-7	Microprocessor Data
	DCC	DC Clamp Control
	DCCNT	DC Control
	DCI	Digital Channel Cording IC
	DCLR	Digital Clear
	DCP	Digital Clamp Pulse
	DCS-CLK, DA	CAS & DV I/F Serial Clock
	DC-STP1	DCS Serial Start
	DC-STP2	DCS Serial Stop
	DCT	Discrete Cosine Transform (Compression)
	DCX7	Serial Data
	DEDP 0-3	Playback Data
	DEDR 0-3	Rec Data
	DEMO	Demodulation
	DEMP	A/D Convertor Empahsis Control
	DEMP	De-Emphasis
	DFD 0-7	Encode Data In/Out Between Shaffling Memory
	DFD0-7	Encode Input/Output Signal for Shuffling Memory
	DIBDCK	Bit Clock
	DICLK	Digital Clock
	DIDAT	Serial Data
	DIDAT	Serial Data Durring Digital Audio In
	DIF	Digital Interface
	DILRCK	L/R Clock
	DILRCK	Serial Clock Durring Digital Audio In
	DIMCK	Master Clock
	DIMCK	Mater Clock Durring Digital Audio In
	DIO 1-8	Data In/Out
	DIOS	Data In/Out Select Control Signal
	DIOS	Select Signal for Digital In/Out
	DIS	Digital Image Stabilizer
	DIS R/B	Digital Image Stabilizer Read (H)/Busy (L)
	DIS R/B	DIS IC Rady/Busy
	DIS/KAND	Digital Image Stabilizer/Sensitivity

	INITIAL/LOGO	ABBREVIATIONS
	DISCS	Dis Chip Select
	DISP	Display
	DL	Delay Line
	DOBCK	Audio A/D Convertor Bit Clock
	DOCTL	Data Output Control Signal
	DODAT	Serial Data (to D/A Converter)
	DOLRCK	Audio A/D Converter LR Clock
	DOLRCK	L/R Clock (to D/A Converter)
	DOMCK	Audio A/D Converter Master Clock
	DOMCK	Master Clock (to D/A Converter)
	DQ 1-16	Memory Data
	DRAM CAS	D-RAM Colum Address Strobe
	DRAM OE	D-RAM Out Enable
	DRAM RAS	D-RAM Read Address Strobe
	DREC	AV Delayed REC Start Pulse
	DRK	Dark (LPF Switch for Auto Focus)
	DS1, 2	Double Sampling Pulse
	DSF 0-7	Data In/Out for Shaffling Memory
	DSF 0-7	Input/Output Data to Shuffling Memory (18MHz)
	DSP	Digital Signal Processor
	DSP R/B	DSP IC Rady/Busy
	DSP-48K-H	DSP IC Clock Select
	DSTB	Data Stobe Signal
	DSV	Digital Sum Variation
	DV	Digital Video
	DVB	Digital Video Broadcast
	DVC	Digital Video Cassette
	DVDD	Digital VDD
	DVIO	Digital Video Input Output
	DVSS	Digital Ground
	DX	Shift Data for X Direction (for LCD)
	DY	Shift Data for Y Direction (for LCD)
	DY	TFT Y-axis Shift Data
	DZ	Digital Zoom
E	E Snap	Electric Snap Shot
	E ZM	Electric Zoom
	E2 CS or E2P CS	EEPROM Chip Select
	E2 R/B	EEPROM Rady/Busy
	E2P	EEPROM
	EARP	Earphone
	EC	Torque Control
	ECC	Error Correction Cording
	ECM	Electric Condencer Mic
	ECR	Reference Voltage for Capstan Torque
	EDA	Error Correction, DCI, ATF Servo
	EE CS	EEPROM Chip Select
	EE R/B	EEPROM Read (H)/Busy (L)
	EEPROM	Electric Erasable Programable Read Only Memory
	EIS	Electric Image Stabilizer (DIS)
	EMP	A/D Convertor Emphasis Control
	ENAB	Enable
	ENV	Enverope
	EOB	End of Block

INITIAL/LOGO		ABBREVIATIONS
	EQ	Equalizer
	EVF	Electric View Finder
	EXT DC	External DC (AC Adaptor)
	EXT DC(H)	AC Adaptor DC (H)
	EXT NOREG	AC Adaptor 6V
	EXT S DATA	Serial Data for Edit
	EXT SCK	Serial Clock for Edit
	EZOOM	Electric Zoom
F		
	F ENC	Lens F-Value
	FACT MODE	Factry Mode (not used in the service)
	FB	Feed Back
	FC	Saw Tooth Signal In
	FCK	Clock
	FCO	Saw Tooth Signal Generator
	FENC	Focus Encoder
	FEND	Frame End Pulse
	FH2B	FH/2 (15.625KHz / 2=7.8125KHz)
	FIX OSD	Auto Tracking Off (H)
	FLICK	Flicker Output
	FM	Field Memory
	FM0-7	Field Memory 0-7
	FMCO0-3	Field Memory Chrominance Out 0-4
	FMDIR	Focus Motor Direction
	FMOEM	Field Memory Enable
	FMOEO	Field Memory Enable
	FMT1-4	Focus Motor Terminal 1-4
	FMY00-07	Field Memory Luminance Out 0-7
	FMYI0-07	Field Memory Luminance In 0-7
	FNO	F Value
	FPS	Frame Refference Signal
	FR	Capstan Reverse High
	FRP	Frame Refference Pulse
	FRPSO	Frame Start Pulse
G	G1, G2, G3	Gap 1, 2 and 3
	GCA	Gain Control AMP
	GCNT	Gain Control
	G-CNT	AGC Adjustment
	GCTRL	Gain Control
	GENE	Generator
	GF	FG AMP Terminal
	GSW	Ground for Switching Power
H	H/M/N	Hi-Fi / Mix / Normal
	H/N	Hi-Fi / Normal
	H1, 2	H. CCD Drive Pulse
	HAP	Horizontal Aperture
	HASW	Head AMP Switching Pulse
	HB	Hall Bias
	HBR SET	High Brightness Set
	HBRST	High Brightness Set
	HCLR	High Clear
	HCP	Shift Clock for Horizontal Drive

INITIAL/LOGO		ABBREVIATIONS
	HD	Horizontal Drive Pulse
	HDTV	High Definition TV
	HEX	Hexadecimal
	HG	Hall Gain
	HID	Head Switching Pulse
	HLT	High Bright Signal
	HALL IN(+), (–)	Input Signal from Hall IC
	HP	Headphone
	HPF	High Pass Filter
	HSE	Modulated Data Output
	HSP	Timing Pulse for Shaffling Memory
	HSS	Horizontal Sync Signal
	HSW	Head Switching Pulse
	HS-WT	High Speed Zoom
	HSZ	High Speed Zoom
I	I/F	Interface
	I-2 C	Inter Integrated Circuit
	ID(H)	Wide Television (H)
	IMP	Inter Microprocessor Protocol
	INF	CCD Input Signal 1
	INF	Input Frame Signal
	INS	CCD Input SIgnal 2
	INTER	Interval Recording
	INV	Inverter
	IOU	R-Y Analogue Signal Output
	IOV	B-Y Analogue Signal Output
	IOY	Y Analogue Signal Output
	IR	Infrared Rays
	IRDET	Imfrared Ray Detection
	IREF	Current Adjustment Terminal
	IRIS/SH	Iris / Shutter Control
	IRQ	Interrupt Request
	ITI	Insert & Track Information
J	JPEG	Joint Photographic Image Cording Experts Group
K	KANDO	Digital Gain Up
	KB	Carrier Balance
	KEY IN	Key Scan
	KND	Digital Gain Up
	KNEE	Luminance Compensate
L	LCD	Liquid Crystal Display
	LCD P(L)	LCD Power On (L)
	LD	Load Pulse
	LDD	Liquid Direct Drive
	LEDCNT	LED Control
	LI-BATT	Lithium Battery
	LOAD	Loading
	LOAD F, R	Loading Direction (F: Forward / R: Reverse)
	LPF	Low Pass Filter
	LRMONO	Monoral Audio (L + R)
	LSB	Least Significant Bit

	INITIAL/LOGO	ABBREVIATIONS
	LVL	LPF Switch for Auto Focus
M	M1-3	Motor Coil Terminal 1 to 3
	MA0-5	Microprocessor Address Data 0-5
	Mbps	Megahertz Bit Per Second
	MD	Modulation
	MD0-7	Microprocessor Data 0-7
	MDT0-7	Microprocessor Data 0-7
	ME (TAPE)	Metal Evaporated (Tape)
	MENB	Focus Motor Enable
	MFF	Manual Focus Far
	MFN	Manual Focus Near
	MHSYNC	Monitor Horizontal Sync Signal
	MIC	Memory In Cassette
	MIG	Meta In Gap
	MIX N.R.D.	Non Rec Data Mix
	MOD	Modulation
	MOUT	Mic Out
	MP (TAPE)	Metal Particle (Tape)
	MPEG	Moving Picture Image Cording Experts Group
	MPEG2	Moving Picture Image Cording Experts Group Phase 2
	MRST	Focus Motor Reset
	MSB	Most Signal Bit
	MVSYNC	Monitor Vertical Sync Signal
N	N/F	Near/Far Focus
	N/P	NTSC/PAL
	NB1-3	Base for NPN Transistor
	NC	No Connection
	NC1-3	Corrector of NPN Transistor
	NCLR	Power On Reset
	NCP1	Clamp Pulse
	NCP2+VDH	Clamp Pulse + Horizontal Drive Pulse
	NCP2+VDM	Clamp Pulse + Gate Pulse
	NDE	Non Liner De-Emphasis
	NE	Emitor of NPN Transistor
	NLE	Non Liner Emphasis
	NR	Noise Reduction
	NRD	Non Rec Data
	NRD BLK	Non Rec Data Blanking
	NRD CLK	No Rec Data Clock
	NRE	Read Enable Input (Low Active)
	NWE	Write Enable (Low Active)
O	OB	Optical Black
	OBCNT	Optical Black Control
	OBREF	Reference Voltage for Optical Black Control
	OE	Output Enable
	OFH	Horizontal Counted Down Clock Signal (Reference)
	OFS	Offset
	OP	Operation AMP Output
	OSD	ON Screen Display
	OVL	Overlap Pulse
	OZ	Optical Zoom

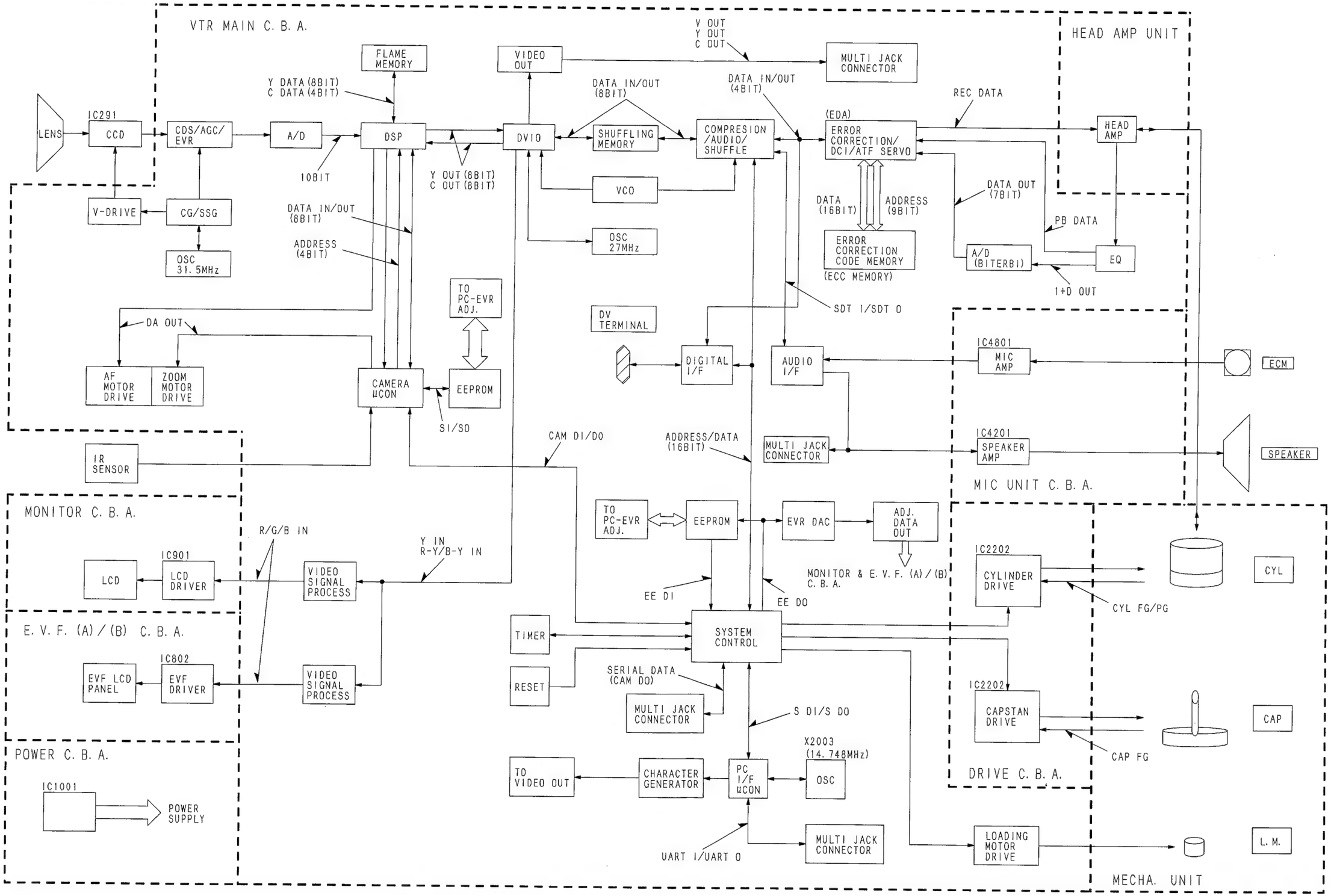
	INITIAL/LOGO	ABBREVIATIONS
P	P SW	Power Switch
	PB1-3	PNP Base 1-3
	PBCTL	Play Back Control
	PBCTL	Pre-Branking Control
	PBH	Head Amp Switch
	PBLK	Pre-Blanking (Pulse)
	PC1-3	Corrector of PNP Transistor
	PCBM	Carrier Balance
	PCH	Phase Compensator (Hall AMP)
	PCI	Phase Compensator (Current)
	PCO	Phase Compensator Out
	PCS	Switching Power Control
	PCV	Phase Compensator (Voltage)
	PE	Emitter of PNP Transistor
	PED	Pedestal
	PEDECNT	Pedestal Control
	PENO	Alarm (L)
	PFP	Pilot Frame Position
	PGA, B	Power Ground A, B
	PGC	Pulse Generator Comparator
	PGI	Pulse Generator Input
	PGMM	Pulse Generator Monostable Multivibrator
	PGO	Output of Pulse Generator AMP
	PMODE	Select Signal for Normal / Wide Screen
	PON	Power On
	POR	Power On Reset
	POSCOM	Common Position
	PREAMP	Pre-AMP
	PREBLK	Pre-Blanking
	PT	Protect for V Voltage
	PWM	Pulse Width Modulation
	PWMB	Pulse Width Modulation Pulse
Q	Q2H	Source Output Select
R	R CTL P	Recorded Control Pulse (+)
	R CTL R	Recorded Control Pulse (–)
	R/B	Read/Busy
	R/L	Direction Control for Data Transmition
	RA	Recording AMP
	RA1	Rec AMP 1
	RAC AC	Rec Audio Current
	RAD	Read Address Data
	RAE	Read Address Enable
	RB	Read Busy
	R-B	R Bias
	RCB	R Carrier Balance
	RE	Read Enable
	RE(F), (S)	Rotary Erase Head Transformer
	REB	R Bias
	REC CC	Rec Current Control
	REC CCNT	Rec Current Control
	RECCTRL	Recording Control Pulse
	RECI	Rec Amp Switch

INITIAL/LOGO		ABBREVIATIONS
	RENCF	Lens Control (Forward)
	RENCR	Lens Control (Reverse)
	RERASE	Rotary Erase Head
	RGBIV1-2	1V Inverted Signal 1-2
	RGO R/G OFF	Offset Voltage for AWT R
	RSF	Capstan Direction (Reverse / Stop / Forward)
	RST	Reset
	RSTB	R Strobe
	RSTPWD	Reset Power Down Input
	RSTR	Reset Read
	RSTW	Reset Write
	RT	Saw Tooth Terminal
	RVCO	Resister for Oscillation
	RW	Read Write
	RWAE	Read Write Enable
S	S PHOT	Supply Photo Transistor
	S/H	Sampling Hold
	S/S	Start/Stop
	SBD	Serial Data
	SBI	Serial Data Input
	SBO	Serial Data Output
	SBT	Serial Clock
	SCAN0-5	Key Scan 0-5
	SCK	Serial Clock
	SCR	Search
	SCR, S.C.R.	Still Cue Review
	SEG.	Segment
	SET	White Balance Set
	SH/IRIS	Shutter/Iris Control
	SHIFT	Capasitor for Phase Shift
	SI	Serial Data Input
	SIC	Shift In Clock Input
	SIOC	Serial In/Out Control
	SMCE	Shaffling Memory Chip Enable
	SMRS	Shaffling Memory Read Strobe
	SMWE	Shaffling Memory Write Enable
	SMWS	Shaffling Memory Read Strobe
	SNAP	Snap Shot
	SNS LED	Sensor LED
	SO	Serial Data Output
	SPA	ATF Smapling Pulse
	SPEN	8 Bit Shift Register Enable
	SPK	Speaker
	SPO	Reset for Switcing Power
	SPST	8 Bit Shift Register Strobe
	SREELP	Supply Reel Pulse
	SRT	Start
	SSA	Start Sync block Area
	SSW	Select Signal for Low Pass Filter
	ST5V	Safety Tab 5V
	STAB	Safety Tab Switch
	STB	Stand by Signal
	STB	Strobe

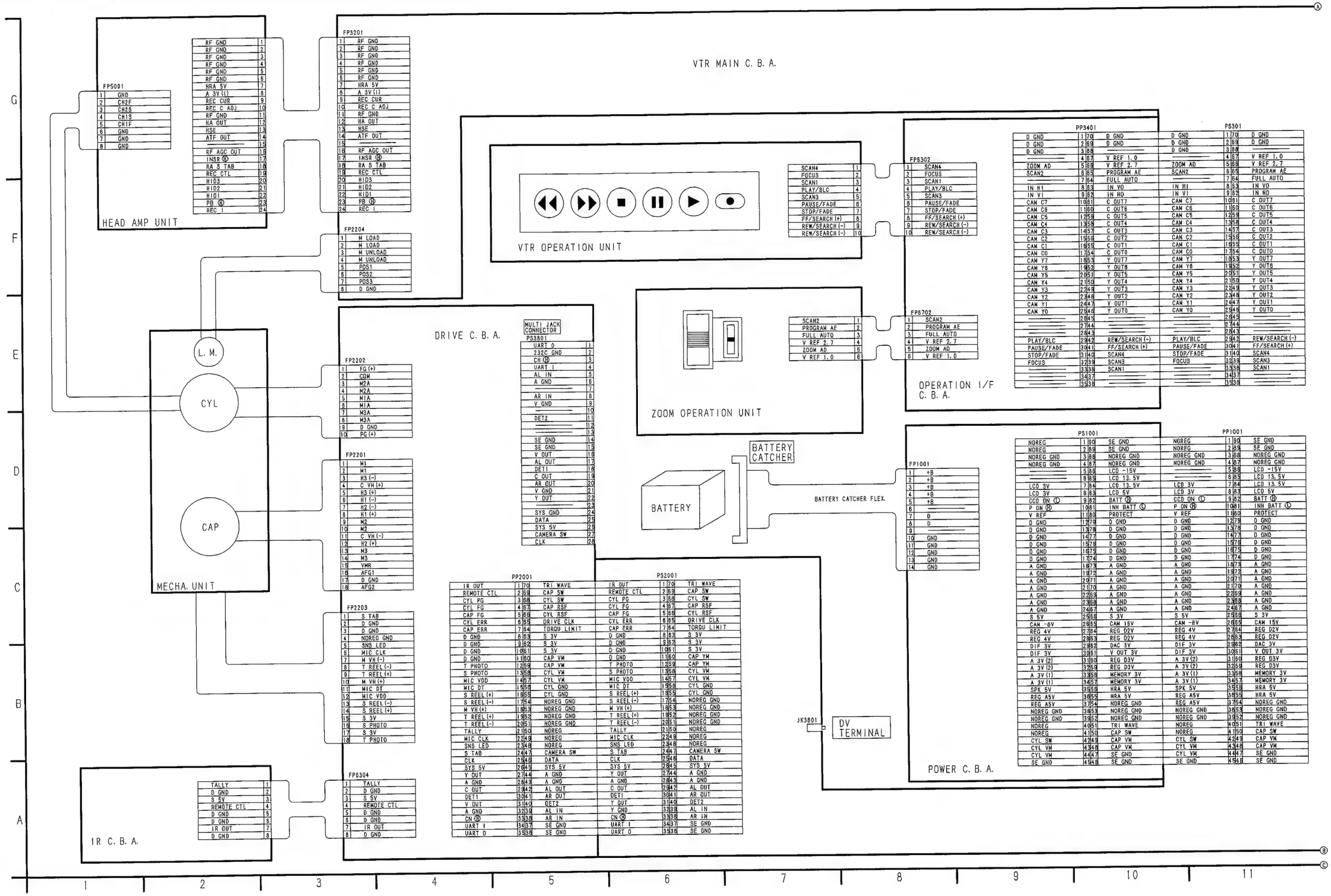
INITIAL/LOGO		ABBREVIATIONS
	SWB	Switching Pre-Drive Pulse
	SYL EC	Cylinder Torque Control
	SYL FG	Cylinder FG
T	T PHOT	Take-up Photo Transistor
	TBC	Time Base Conntrol
	TFT	Thim Film Transistor
	TH	Thermostat for Battery
	TI	Test Mode Select
	TL	Torque Limit
	TM	Sub Code
	TMD	Sub Code Data
	TRE	Tracking Error Signal
	TREEL(P)	Take-up Reel (Pulse)
	TRFIX	Tracking Fix
	TRIWAVE	Tracking Wave
	TRP	Tracking Position
	TRP	Trap
	TSR	Head Switching Refference
	TST	Time Scale Transfer
U	U/V SEL	R-Y/B-Y Select Signal
	UNLOAD	Un-Loading
	UNRE	Microprocessor Read Enable
	UNWE	Microprocessor Write Enable
	UV	R-Y/B-Y
	UV SEL	R-Y/B-Y Select Signal
V	V1-V4	V. CCD Drive Pulse
	VB	VH Filter Switching
	VCE	Power Terminal
	VCNTL	Video Control
	VCO	Voltage Control Oscillator
	VCP	Shift Clock Output for Vertical Drive
	VCTLD	Video Control
	VCTRL	Voltage Charge Control
	VD	Vertical Drive Pulse
	VDDX	X Drive Power for Colour LCD
	VDDXY	XY Drive Power for Colour LCD
	VDDY	Y Drive Power for Colour LCD
	VDREC	Video Delayed Rec
	Vgg	Voltage for Gate IC
	Vgl	Gate off Voltage
	VID	Video Signal Out
	VIN	Video In
	VITC	Vertical Interval Time Code
	VITERBI	One of Signal Detection Method
	VL	Low Voltage
	VLC	Variable Length Cording
	VLOCKP	Artificial Sync Pulse
	VLP	Artificial Sync Pulse
	VM	Motor Voltage
	VMD	Velocity Mode Data
	VMD1-3	Electric Shutter Mode

	INITIAL/LOGO	ABBREVIATIONS		INITIAL/LOGO	ABBREVIATIONS
	VMODE	NTSC/PAL Select Switch			
	VMVH	VH Filter Switching			
	VORP	Video Overlap			
	VRB	Voltage Refference Bottom			
	VRBS	Voltage Refference Bottom Output			
	VREF1R3V	Refference Voltage 1.3V			
	VREF3R3V	Refference Voltage 3.3V			
	VREFH	Refference Voltage High Side			
	VREFL	Refference Voltage Low Side			
	VRI	Refference Voltage Input			
	VRO	Refference Voltage Output			
	VRT	Voltage Refference Top			
	VRTS	Voltage Refference Top Output			
	VS	Switching Comparator			
	VSS	Vertical Sync Signal			
	VSSX	X Driver Power for Colour LCD			
	VSSXY	X-Y Driver Power for Colour LCD			
W	W/N	Mode Select for Window Mode			
	W/N	Wide / Normal			
	WAD	Write Address Enable			
	WAE	Write Address Enable			
	WAERAE	Write Address Enable			
	WARI	Interrupt			
	WB	White Balance			
	WE	Write Enable			
	WEM	Memory Write Enable			
	WHD	Wide Horizontal Drive Pulse			
	WIDE A	Wide Zoom			
	WSB	B AGC Control			
	WSR	R AGC Control			
	WTV	Wide TV			
X	XP	FG Logic Reset			
Y	Y FM0-7	Y Field Memory 0-7			
	YCE	Cylinder Error Code			
	YGC	Y Gain Control			
	YMO 0-7	Y Field Memory 0-7			
	YNCST	Noize Canceller			
	YNR	Luminance Noise Reduction			
	YSDP 0-7	Digital Y Out 0-7			
Z	Z.ENC	Zoom Encoder			
	Z.MIC	Zoom Mic			
	ZENC	Zoom Encoder Output			
	ZMDIR	Zoom Drive			
	ZMEN	Zoom Enable			
	ZMT	Zoom Motor Tele Side			
	ZMT (+)/(–)	Zoom Motor (+)/(–)			
	ZMTER	Zoom Motor Tele Side			
	ZMW	Zoom Motor Wide Side			
	ZSW	Zoom Switch			

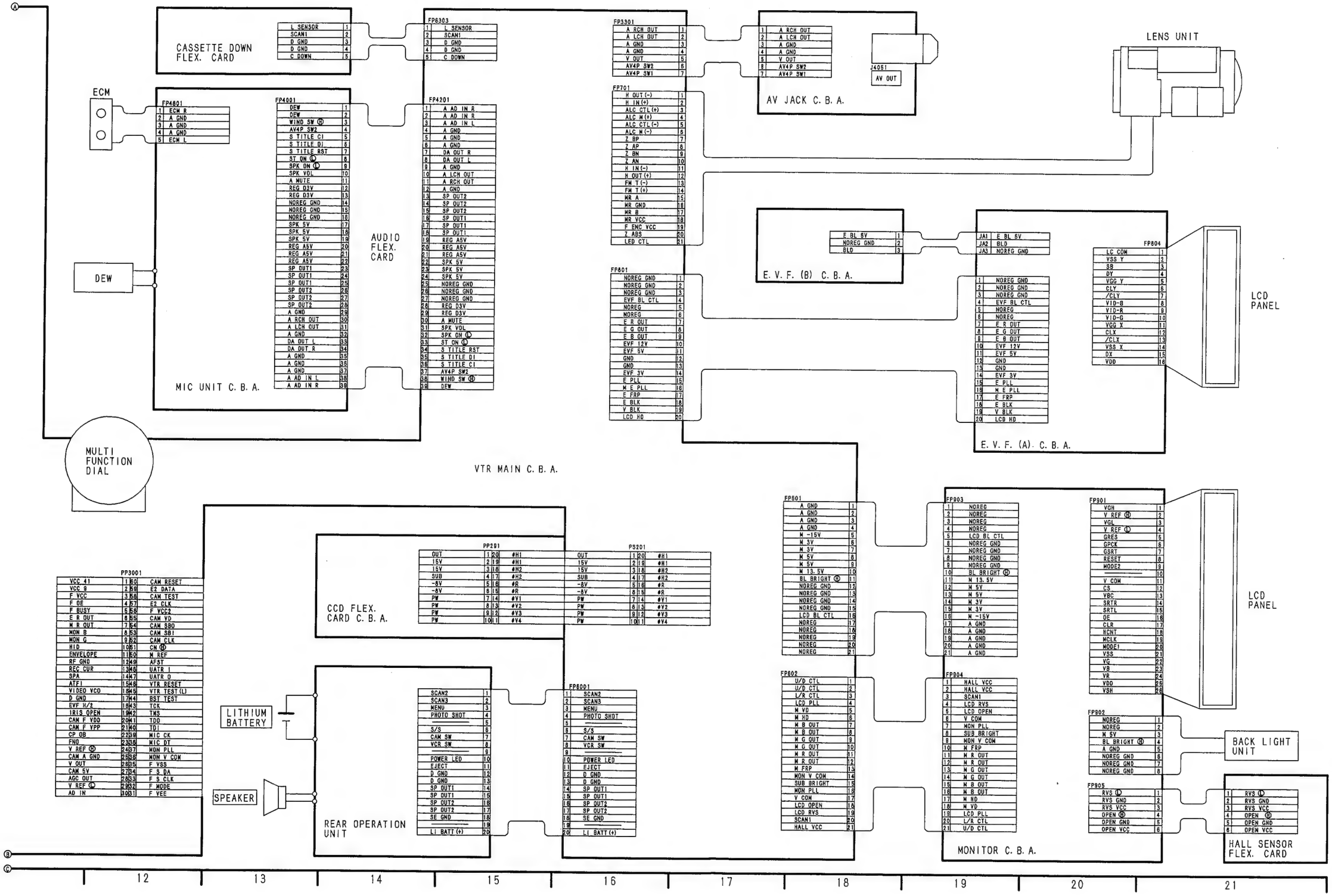
3-2. OVERALL BLOCK DIAGRAM



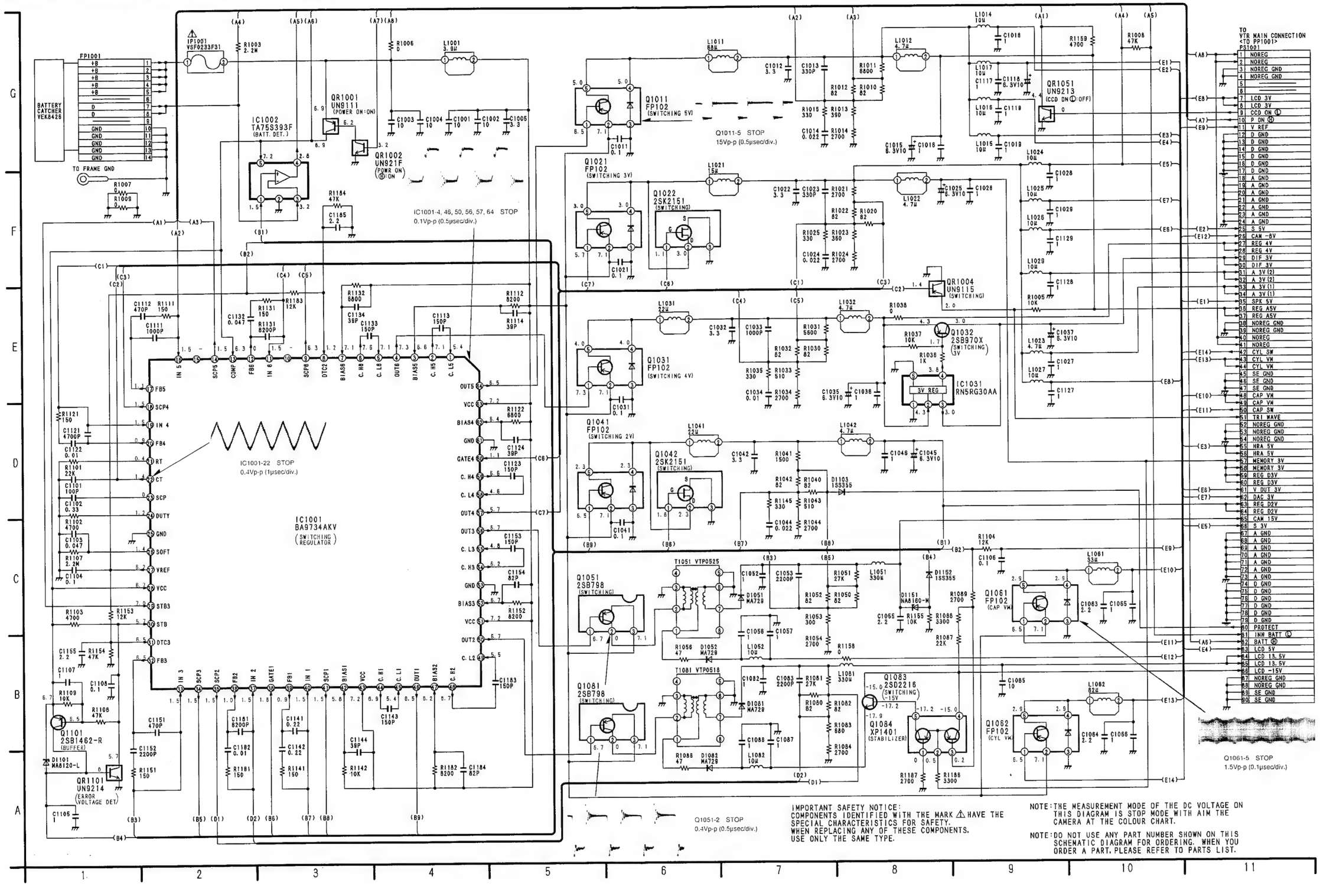
3-3. INTERCONNECTION SCHEMATIC DIAGRAM



Back Page:
OVERALL Section

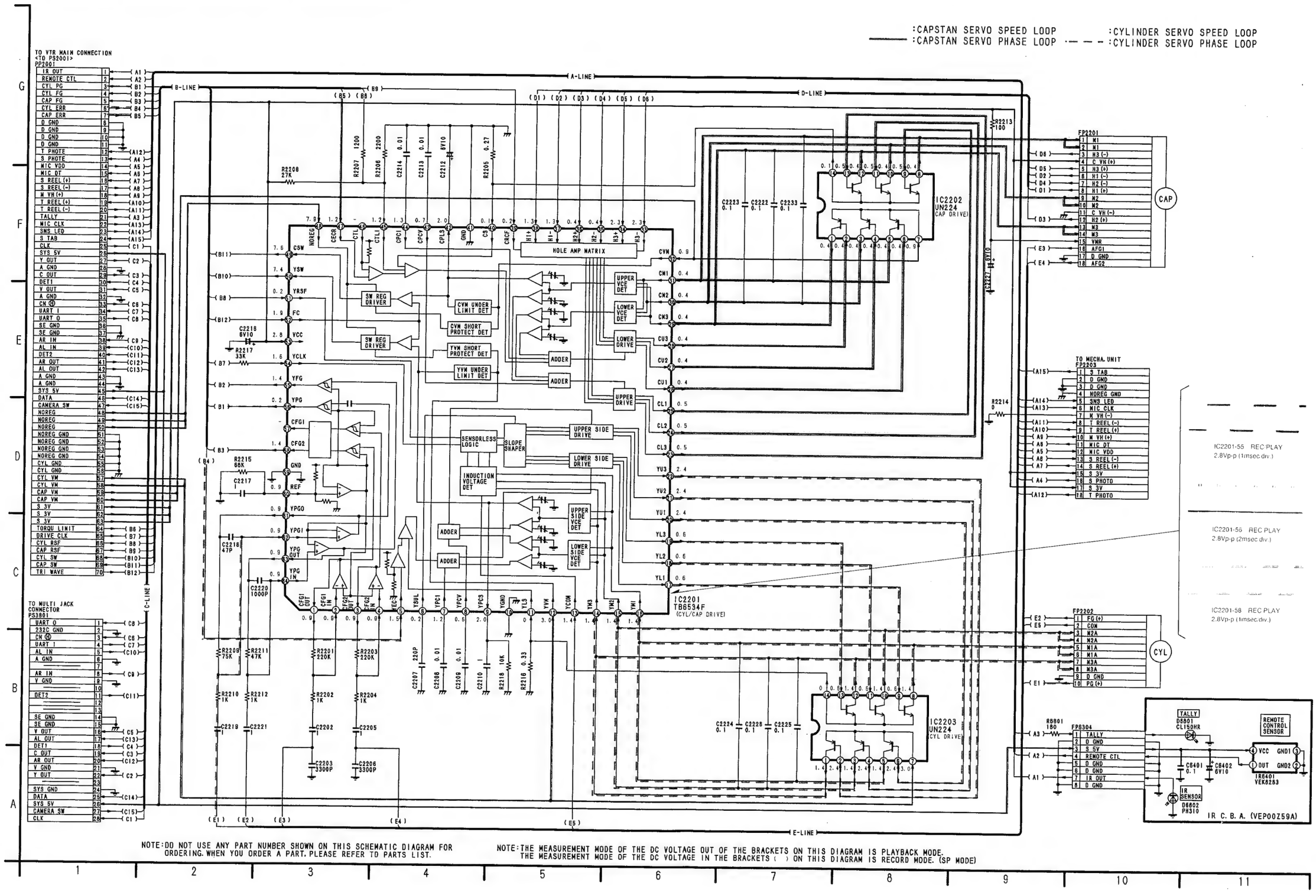

CASSETTE DOWN FLEX. CARD
L SENSOR 1
SCAN1 2
D GND 3
D GND 4
C DOWN 5
FP6303
1 L SENSOR
2 SCAN1
3 D GND
4 D GND
5 C DOWN
ECM
FP4801
1 ECM R
2 A GND
3 A GND
4 A GND
5 ECM L
FP4001
DEW 1
DEW 2
WIND SW Ⓗ 3
AV4P SW2 4
S TITLE CI 5
S TITLE DI 6
S TITLE RST 7
ST ON Ⓛ 8
SPK ON Ⓛ 9
SPK VOL 10
A MUTE 11
REG D3V 12
REG D3V 13
NOREG GND 14
NOREG GND 15
NOREG GND 16
SPK 5V 17
SPK 5V 18
SPK 5V 19
REG A5V 20
REG A5V 21
REG A5V 22
SP OUT1 23
SP OUT1 24
SP OUT1 25
SP OUT2 26
SP OUT2 27
SP OUT2 28
A GND 29
A RCH OUT 30
A LCH OUT 31
A GND 32
DA OUT L 33
DA OUT R 34
A GND 35
A GND 36
A GND 37
A AD IN L 38
A AD IN R 39
FP4201
1 A AD IN R
2 A AD IN R
3 A AD IN L
4 A GND
5 A GND
6 A GND
7 DA OUT R
8 DA OUT L
9 A GND
10 A LCH OUT
11 A RCH OUT
12 A GND
13 SP OUT2
14 SP OUT2
15 SP OUT2
16 SP OUT1
17 SP OUT1
18 SP OUT1
19 REG A5V
20 REG A5V
21 REG A5V
22 SPK 5V
23 SPK 5V
24 SPK 5V
25 NOREG GND
26 NOREG GND
27 NOREG GND
28 REG D3V
29 REG D3V
30 A MUTE
31 SPK VOL
32 SPK ON Ⓛ
33 ST ON Ⓛ
34 S TITLE RST
35 S TITLE DI
36 S TITLE CI
37 AV4P SW2
38 WIND SW Ⓗ
39 DEW
AUDIO FLEX. CARD
MIC UNIT C. B. A.
DEW
MULTI FUNCTION DIAL
VTR MAIN C. B. A.
FP3301
A RCH OUT 1
A LCH OUT 2
A GND 3
A GND 4
V OUT 5
AV4P SW2 6
AV4P SW1 7
1 A RCH OUT
2 A LCH OUT
3 A GND
4 A GND
5 V OUT
6 AV4P SW2
7 AV4P SW1
J4051
AV OUT
AV JACK C. B. A.
LENS UNIT
FP701
H OUT(-) 1
H IN(+) 2
ALC CTL(+) 3
ALC M(+) 4
ALC CTL(-) 5
ALC M(-) 6
Z BP 7
Z AP 8
Z BN 9
Z AN 10
H IN(-) 11
H OUT(+) 12
FM T(-) 13
FM T(+) 14
MR A 15
MR GND 16
MR B 17
MR VCC 18
F ENC VCC 19
Z ABS 20
LED CTL 21
E BL 6V 1
NOREG GND 2
BLD 3
JA1 E BL 6V
JA2 BLD
JA3 NOREG GND
E. V. F. (B) C. B. A.
FP804
LC COM 1
VSS Y 2
SB 3
DY 4
VGG Y 5
CLY 6
/CLY 7
VID-B 8
VID-R 9
VID-G 10
VGG X 11
CLX 12
/CLX 13
VSS X 14
DX 15
VDD 16
LCD PANEL
FP601
NOREG GND 1
NOREG GND 2
NOREG GND 3
EVF BL CTL 4
NOREG 5
NOREG 6
E R OUT 7
E G OUT 8
E B OUT 9
EVF 12V 10
EVF 5V 11
GND 12
GND 13
EVF 3V 14
E PLL 15
M E PLL 16
E FRP 17
E BLK 18
V BLK 19
LCD HD 20
1 NOREG GND
2 NOREG GND
3 NOREG GND
4 EVF BL CTL
5 NOREG
6 NOREG
7 E R OUT
8 E G OUT
9 E B OUT
10 EVF 12V
11 EVF 5V
12 GND
13 GND
14 EVF 3V
15 E PLL
16 M E PLL
17 E FRP
18 E BLK
19 V BLK
20 LCD HD
E. V. F. (A) C. B. A.
PP3001
VCC 41 1 60 CAM RESET
VCC 9 2 59 E2 DATA
F VCC 3 58 CAM TEST
F OE 4 57 E2 CLK
F BUSY 5 56 F VCC2
E R OUT 6 55 CAM VD
M R OUT 7 54 CAM SBO
MON B 8 53 CAM SBI
MON G 9 52 CAM CLK
HID 10 51 CN Ⓗ
ENVELOPE 11 50 M REF
RF GND 12 49 AFST
REC CUR 13 48 UATR I
SPA 14 47 UATR O
ATFI 15 46 VTR RESET
VIDEO VCO 16 45 VTR TEST(L)
D GND 17 44 BST TEST
EVF H/2 18 43 TCK
IRIS OPEN 19 42 TMS
CAM F VDD 20 41 TDO
CAM F VPP 21 40 TDI
CP OB 22 39 MIC CK
FNO 23 38 MIC DT
V REF Ⓗ 24 37 MON PLL
CAM A GND 25 36 MON V COM
V OUT 26 35 F VSS
CAM 5V 27 34 F S DA
AGC OUT 28 33 F S CLK
V REF Ⓛ 29 32 F MODE
AD IN 30 31 F VEE
CCD FLEX. CARD C. B. A.
PP291
OUT 1 20 #H1
15V 2 19 #H1
15V 3 18 #H2
SUB 4 17 #H2
-8V 5 16 #R
-8V 6 15 #R
PW 7 14 #V1
PW 8 13 #V2
PW 9 12 #V3
PW 10 11 #V4
PS201
OUT 1 20 #H1
15V 2 19 #H1
15V 3 18 #H2
SUB 4 17 #H2
-8V 5 16 #R
-8V 6 15 #R
PW 7 14 #V1
PW 8 13 #V2
PW 9 12 #V3
PW 10 11 #V4
LITHIUM BATTERY
SPEAKER
REAR OPERATION UNIT
FP6001
SCAN2 1
SCAN3 2
MENU 3
PHOTO SHOT 4
5
S/S 6
CAM SW 7
VCR SW 8
9
POWER LED 10
EJECT 11
D GND 12
D GND 13
SP OUT1 14
SP OUT1 15
SP OUT2 16
SP OUT2 17
SE GND 18
19
LI BATT(+) 20
1 SCAN2
2 SCAN3
3 MENU
4 PHOTO SHOT
5
6 S/S
7 CAM SW
8 VCR SW
9
10 POWER LED
11 EJECT
12 D GND
13 D GND
14 SP OUT1
15 SP OUT1
16 SP OUT2
17 SP OUT2
18 SE GND
19
20 LI BATT(+)
FP501
A GND 1
A GND 2
A GND 3
A GND 4
M -15V 5
M 3V 6
M 3V 7
M 5V 8
M 5V 9
M 13.5V 10
BL BRIGHT Ⓗ 11
NOREG GND 12
NOREG GND 13
NOREG GND 14
NOREG GND 15
LCD BL CTL 16
NOREG 17
NOREG 18
NOREG 19
NOREG 20
NOREG 21
FP602
U/D CTL 1
U/D CTL 2
L/R CTL 3
LCD PLL 4
M VD 5
M HD 6
M B OUT 7
M B OUT 8
M G OUT 9
M G OUT 10
M R OUT 11
M R OUT 12
M FRP 13
MON V COM 14
SUB BRIGHT 15
MON PLL 16
V COM 17
LCD OPEN 18
LCD RVS 19
SCAN1 20
HALL VCC 21
FP903
1 NOREG
2 NOREG
3 NOREG
4 NOREG
5 LCD BL CTL
6 NOREG GND
7 NOREG GND
8 NOREG GND
9 NOREG GND
10 BL BRIGHT Ⓗ
11 M 13.5V
12 M 5V
13 M 5V
14 M 3V
15 M 3V
16 M -15V
17 A GND
18 A GND
19 A GND
20 A GND
21 A GND
FP904
1 HALL VCC
2 HALL VCC
3 SCAN1
4 LCD RVS
5 LCD OPEN
6 V COM
7 MON PLL
8 SUB BRIGHT
9 MON V COM
10 M FRP
11 M R OUT
12 M R OUT
13 M G OUT
14 M G OUT
15 M B OUT
16 M B OUT
17 M HD
18 M VD
19 LCD PLL
20 L/R CTL
21 U/D CTL
MONITOR C. B. A.
FP901
VGH 1
V REF Ⓗ 2
VGL 3
V REF Ⓛ 4
GRES 5
GPCK 6
GSRT 7
RESET 8
MODE2 9
10
V COM 11
CS 12
VBC 13
SRTR 14
SRTL 15
OE 16
CLR 17
NCNT 18
MCLK 19
MODE1 20
VSS 21
VG 22
VB 23
VR 24
VDD 25
VSH 26
LCD PANEL
FP902
NOREG 1
NOREG 2
M 5V 3
BL BRIGHT Ⓗ 4
A GND 5
NOREG GND 6
NOREG GND 7
NOREG GND 8
BACK LIGHT UNIT
FP905
RVS Ⓛ 1
RVS GND 2
RVS VCC 3
OPEN Ⓗ 4
OPEN GND 5
OPEN VCC 6
1 RVS Ⓛ
2 RVS GND
3 RVS VCC
4 OPEN Ⓗ
5 OPEN GND
6 OPEN VCC
HALL SENSOR FLEX. CARD
12
13
14
15
16
17
18
19
20
21

3-4. POWER SCHEMATIC DIAGRAM



Back Page:
INTERCONNECTION Section

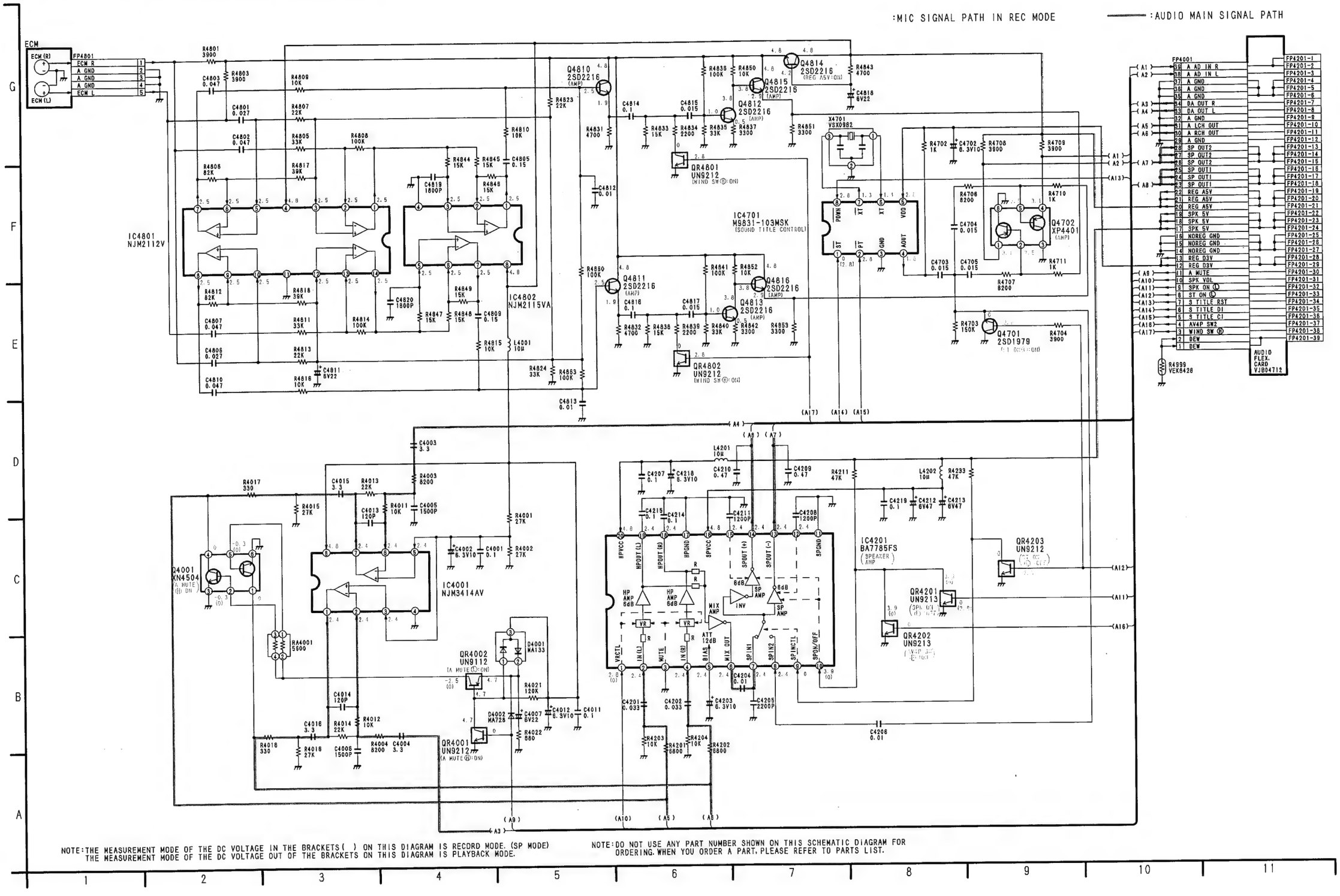
3-5. DRIVE & IR SCHEMATIC DIAGRAM



NOTE: DO NOT USE ANY PART NUMBER SHOWN ON THIS SCHEMATIC DIAGRAM FOR ORDERING. WHEN YOU ORDER A PART, PLEASE REFER TO PARTS LIST.

NOTE: THE MEASUREMENT MODE OF THE DC VOLTAGE OUT OF THE BRACKETS ON THIS DIAGRAM IS PLAYBACK MODE.
THE MEASUREMENT MODE OF THE DC VOLTAGE IN THE BRACKETS ( ) ON THIS DIAGRAM IS RECORD MODE. (SP MODE)

3-6. MIC UNIT SCHEMATIC DIAGRAM

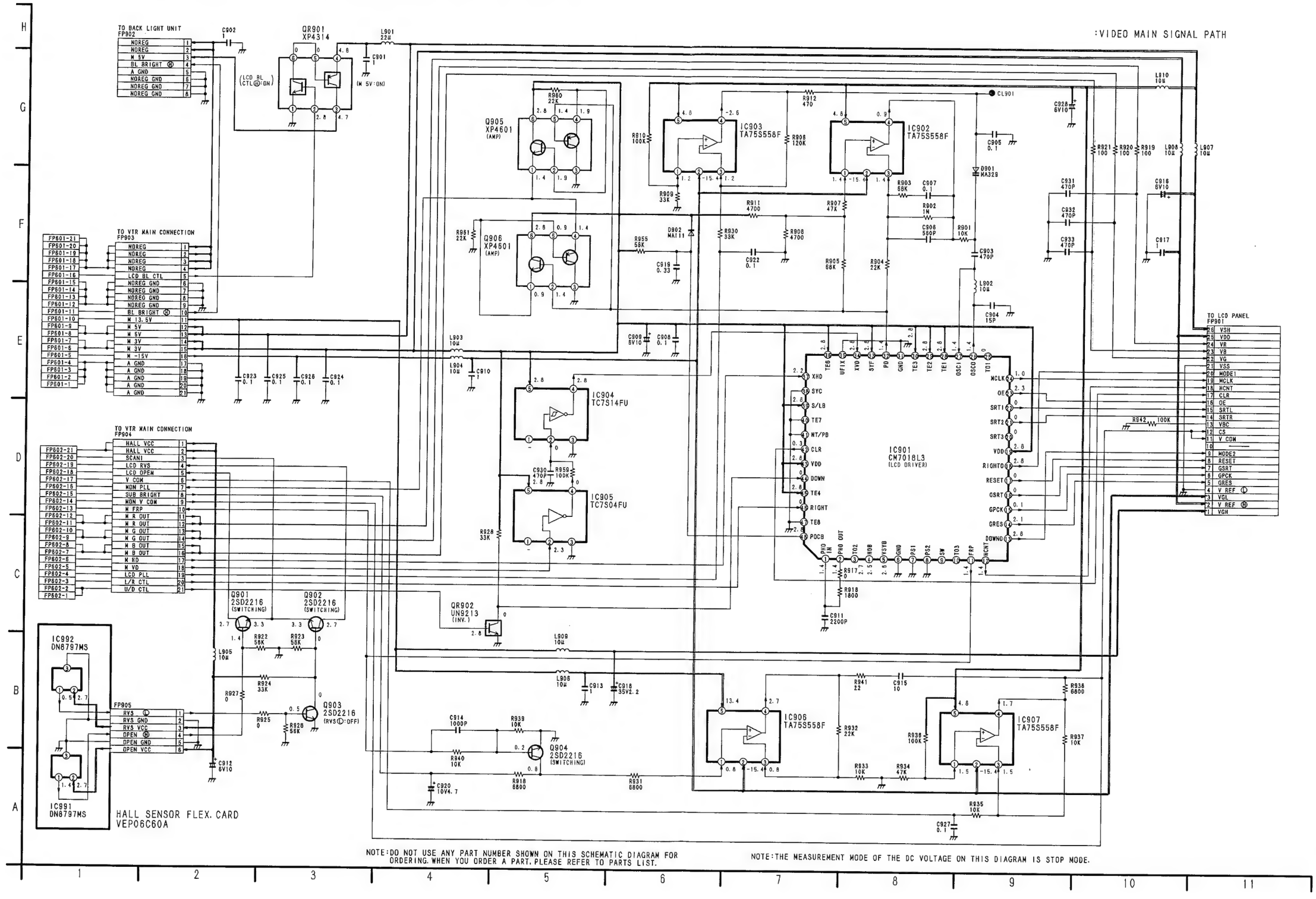


NOTE: THE MEASUREMENT MODE OF THE DC VOLTAGE IN THE BRACKETS ( ) ON THIS DIAGRAM IS RECORD MODE. (SP MODE)
THE MEASUREMENT MODE OF THE DC VOLTAGE OUT OF THE BRACKETS ON THIS DIAGRAM IS PLAYBACK MODE.

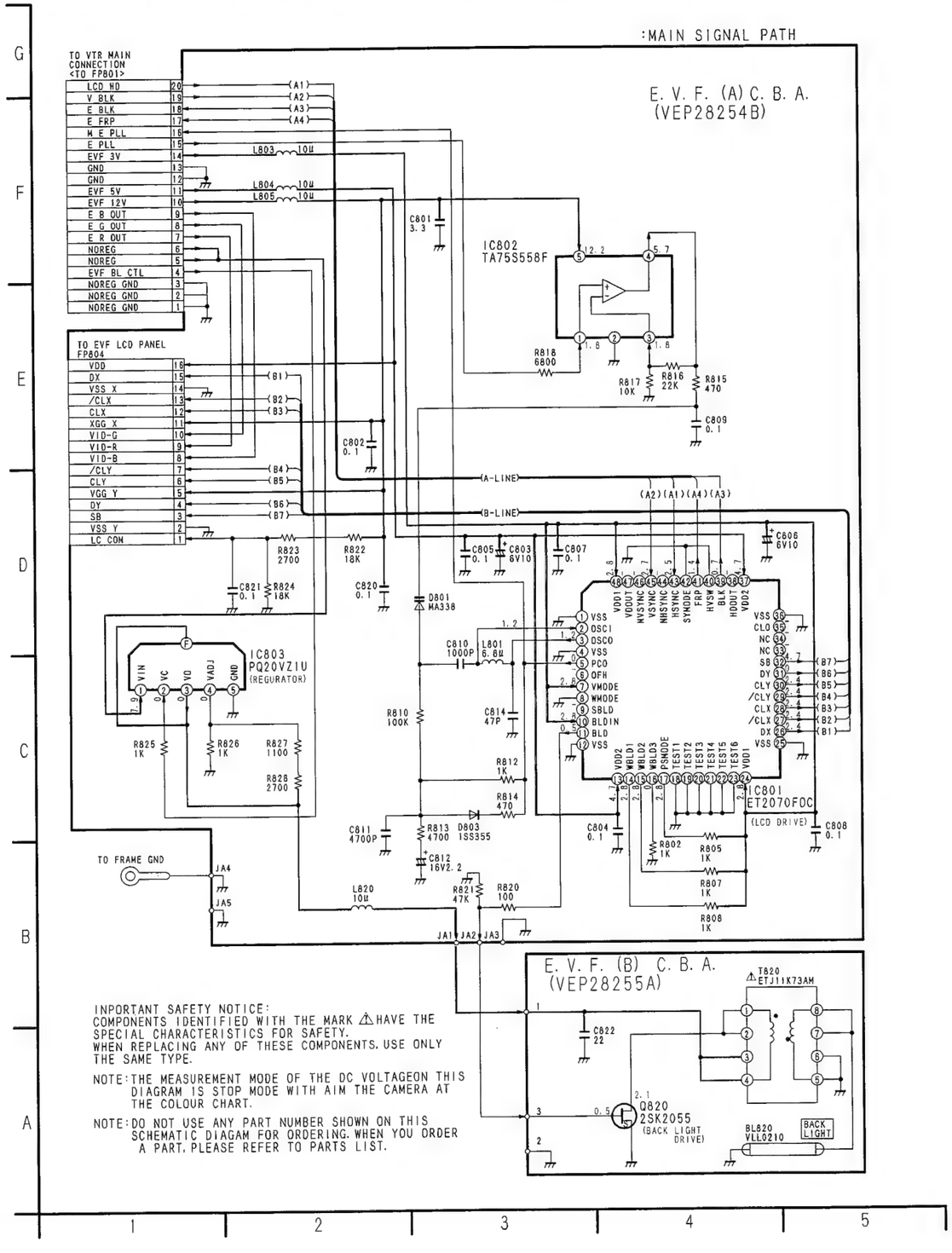
NOTE: DO NOT USE ANY PART NUMBER SHOWN ON THIS SCHEMATIC DIAGRAM FOR ORDERING. WHEN YOU ORDER A PART, PLEASE REFER TO PARTS LIST.

Back Page:
DRIVE Section

3-7. MONITOR & HALL SENSOR FLEX. CARD SCHEMATIC DIAGRAM

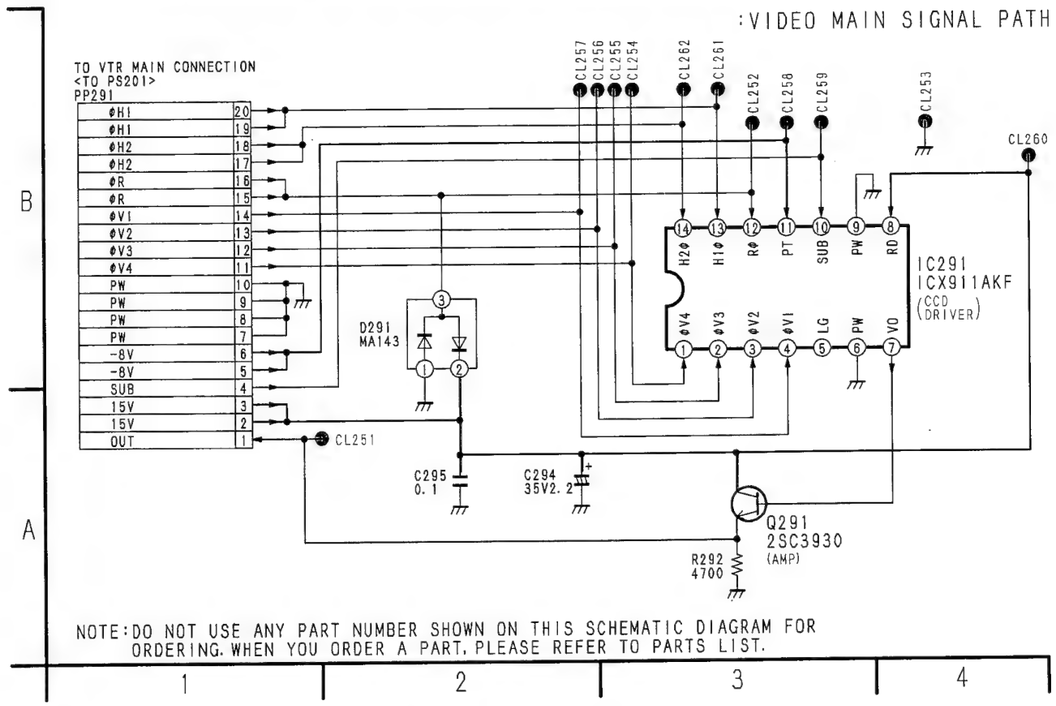


3-8. E.V.F. (A) & E.V.F. (B) SCHEMATIC DIAGRAM

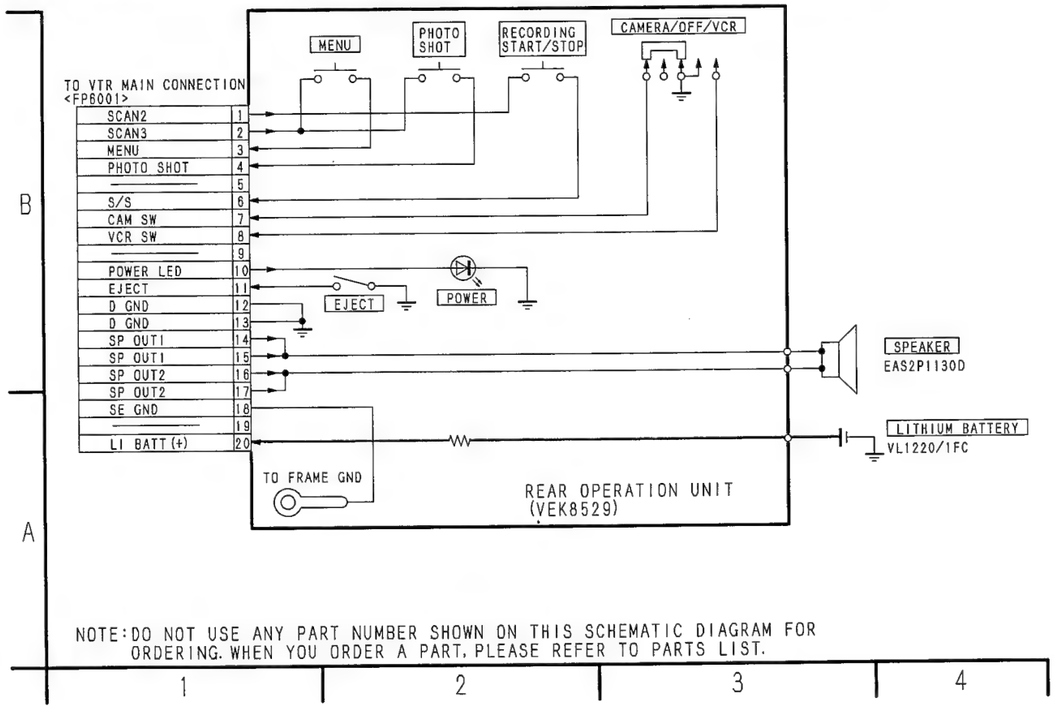


Back Page:
MONITOR Section

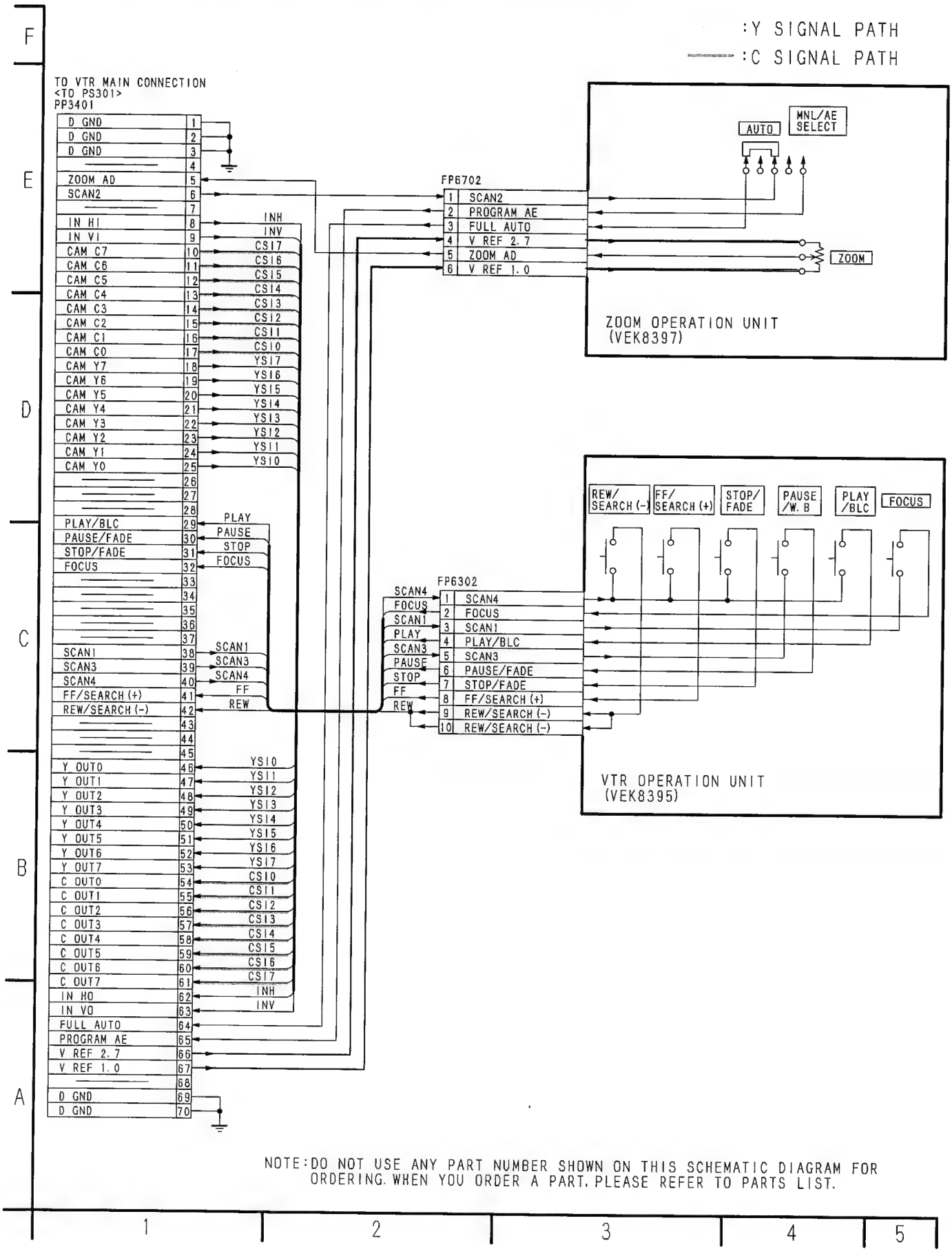
3-9. CCD FLEX. CARD SCHEMATIC DIAGRAM



3-10. REAR OPERATION UNIT SCHEMATIC DIAGRAM

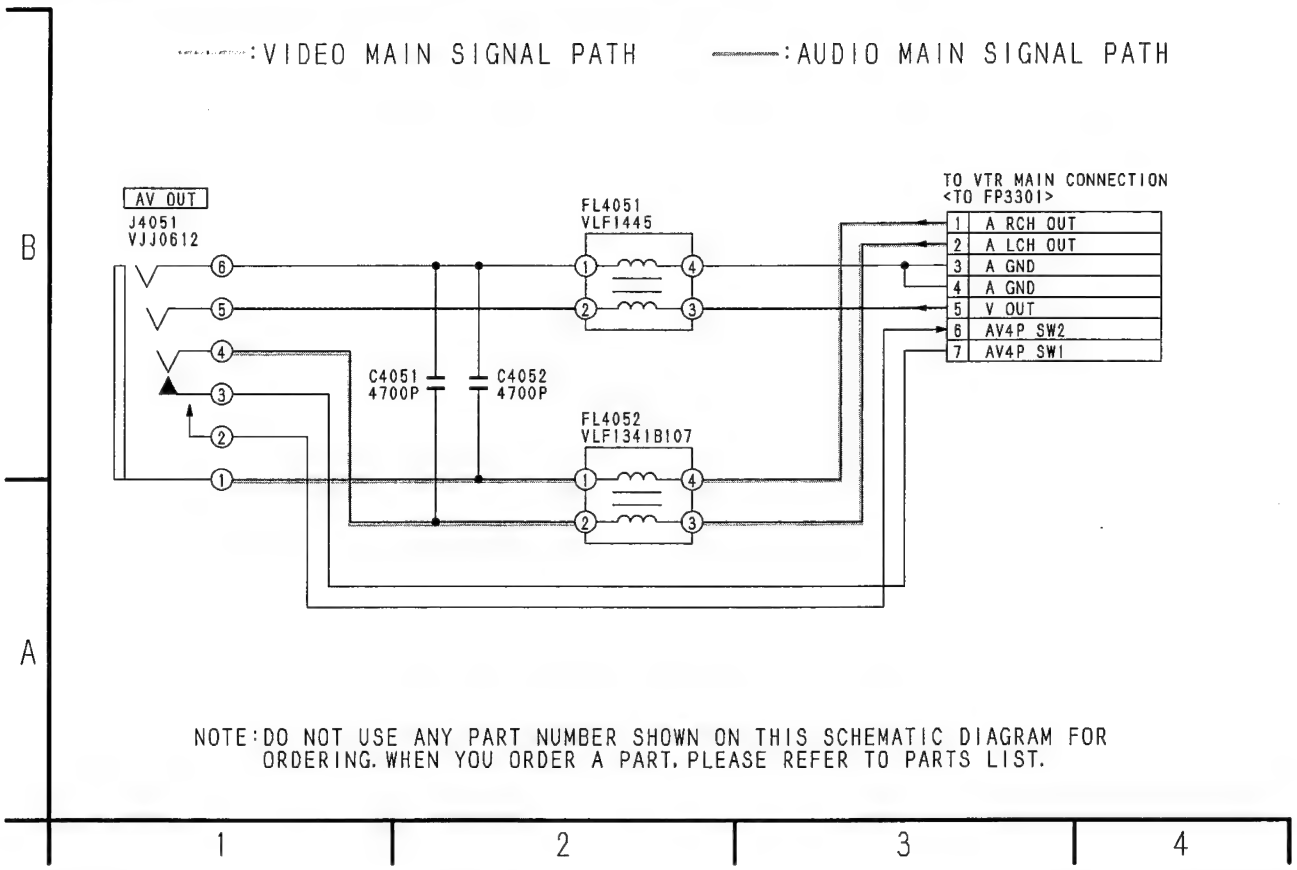


3-11. OPERATION I/F SCHEMATIC DIAGRAM



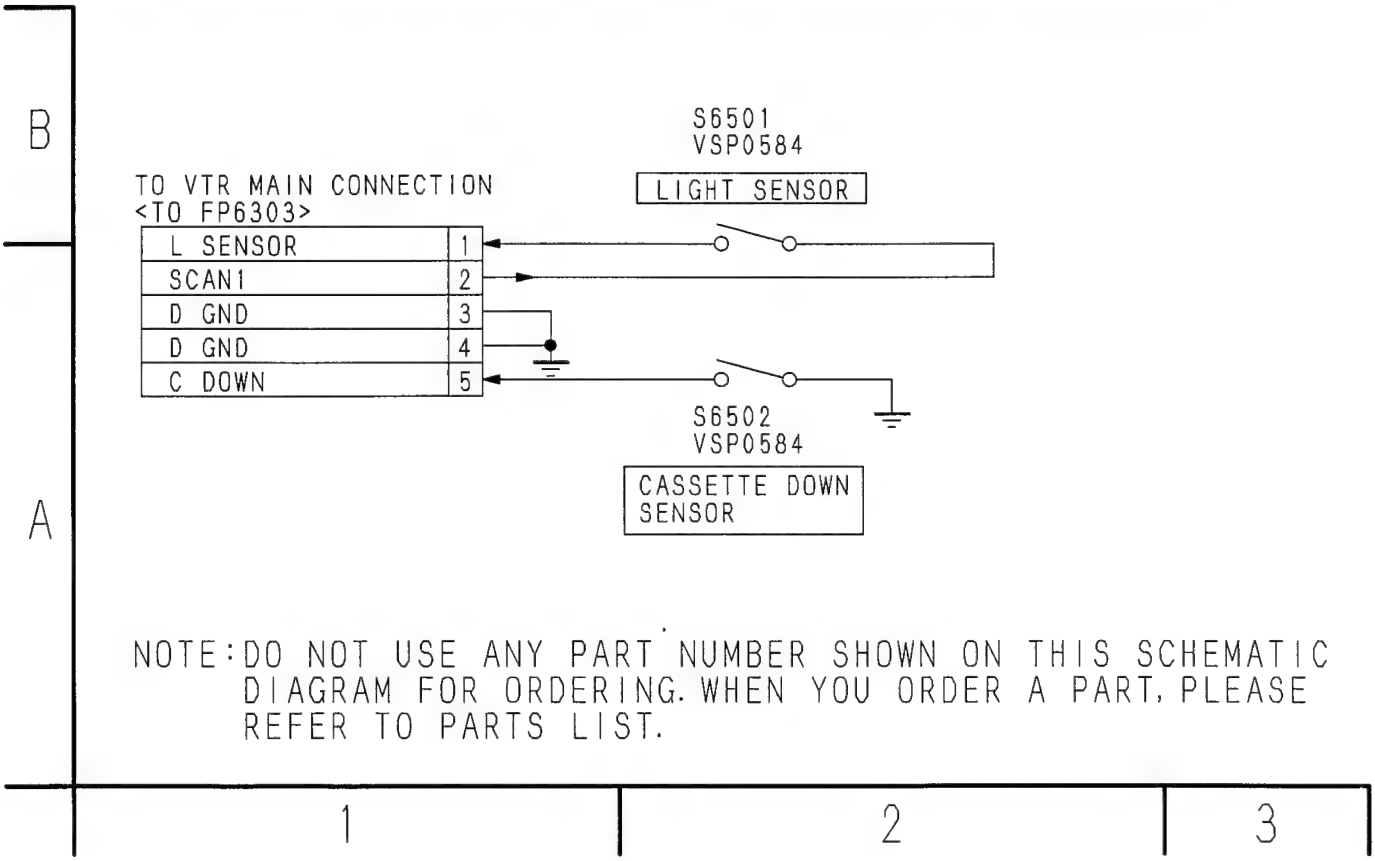
NOTE: DO NOT USE ANY PART NUMBER SHOWN ON THIS SCHEMATIC DIAGRAM FOR ORDERING. WHEN YOU ORDER A PART, PLEASE REFER TO PARTS LIST.

3-12. AV JACK SCHEMATIC DIAGRAM



NOTE: DO NOT USE ANY PART NUMBER SHOWN ON THIS SCHEMATIC DIAGRAM FOR ORDERING. WHEN YOU ORDER A PART, PLEASE REFER TO PARTS LIST.

3-13. CASSETTE DOWN FLEX. CARD SCHEMATIC DIAGRAM

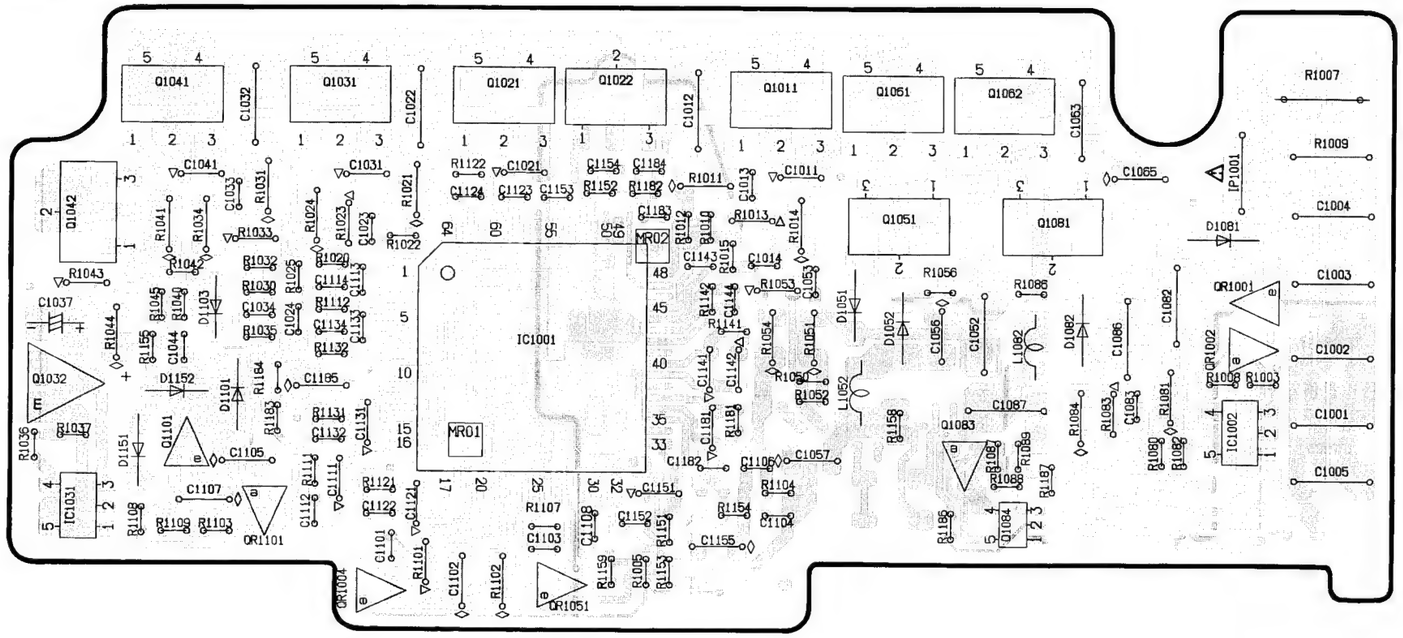


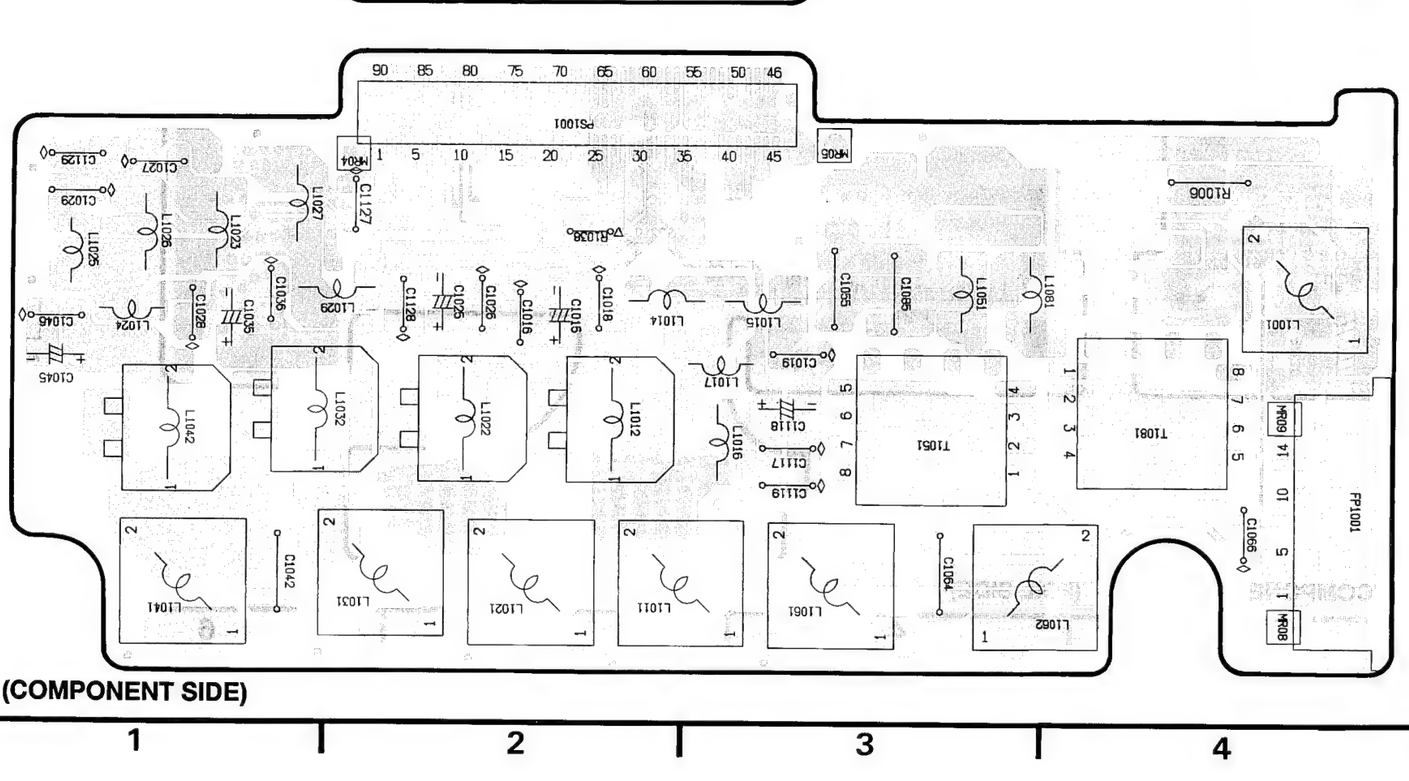
NOTE: DO NOT USE ANY PART NUMBER SHOWN ON THIS SCHEMATIC DIAGRAM FOR ORDERING. WHEN YOU ORDER A PART, PLEASE REFER TO PARTS LIST.

3-14. POWER C.B.A. (VEP01827B)

NOTE : MULTILAYER C.B.A.
THIS C.B.A. IS Multi-Layer C.B.A. THIS CIRCUIT BOARD SHOWS COMPONENT LAYOUT-PATTERN FOR COMPONENT SIDE AND FOIL SIDE. LAYOUT-PATTERNS ARE SINGLE PATTERN FOR EACH SIDE THAT MAKE EASY TO SIGHT THE COMPONENT LAYOUT.

(FOIL SIDE)





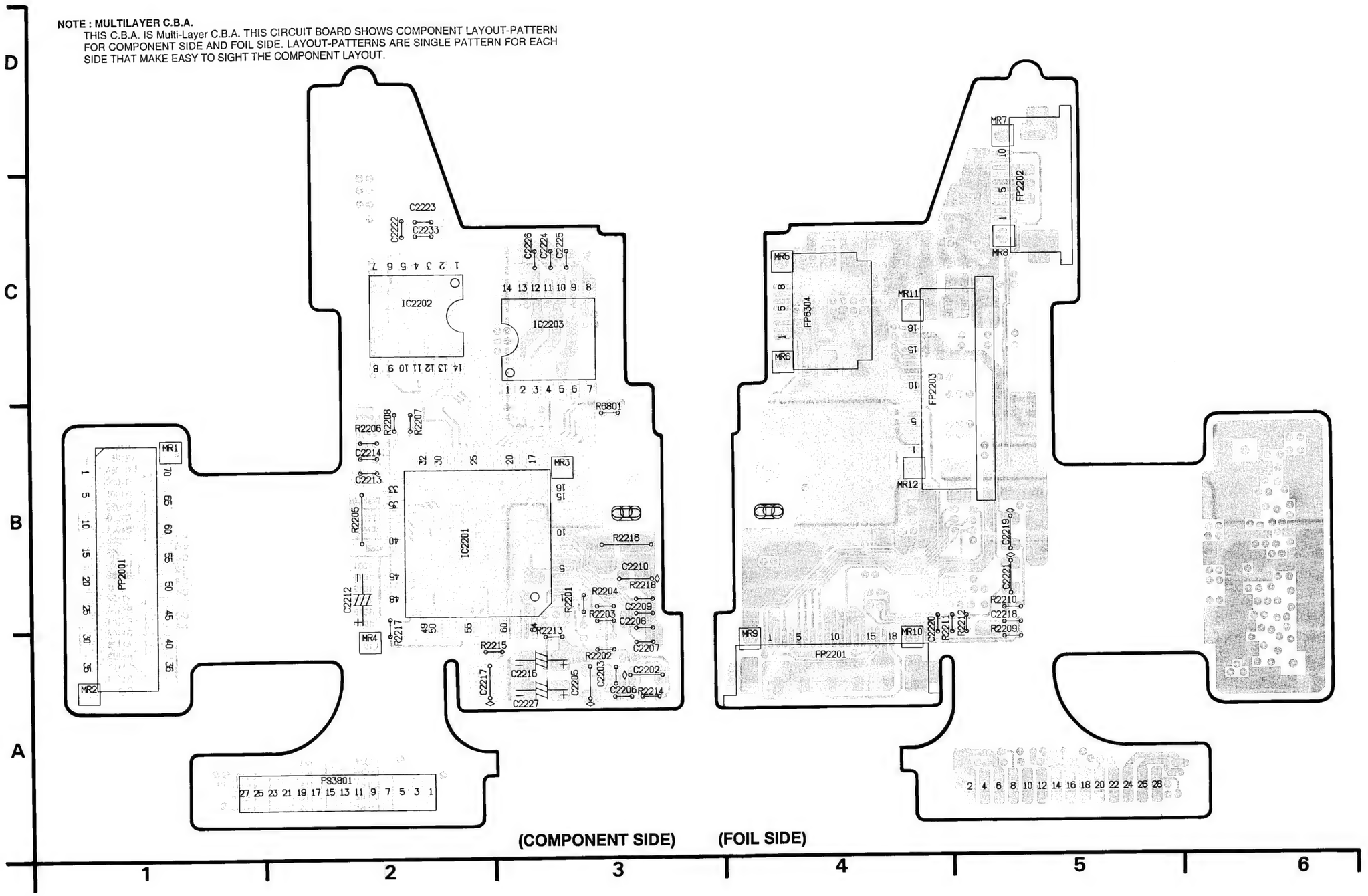
(COMPONENT SIDE)

POWER C.B.A.					
Integrated Circuit		C1005	C-4	C1184	D-2
IC1001	C-2	C1011	D-3	C1185	C-1
IC1002	C-4	C1012	D-3	**Resistor**	
IC1031	C-1	C1013	D-3	R1003	C-4
Transistor		C1014	D-3	R1005	C-2
Q1011	D-3	C1015	B-2	R1006	B-4
Q1021	D-2	C1016	B-2	R1007	D-4
Q1022	D-2	C1018	B-2	R1008	C-4
Q1031	D-2	C1019	B-3	R1009	D-4
Q1032	C-1	C1021	D-2	R1010	D-3
Q1041	D-1	C1022	D-2	R1011	D-3
Q1042	D-1	C1023	D-2	R1012	D-3
Q1051	D-3	C1024	C-1	R1013	D-3
Q1061	D-3	C1025	B-2	R1014	D-3
Q1062	D-3	C1026	B-2	R1015	D-3
Q1081	D-4	C1027	B-1	R1020	D-2
Q1083	C-3	C1028	B-1	R1021	D-2
Q1084	C-3	C1029	B-1	R1022	D-2
Q1101	C-1	C1031	D-2	R1023	D-2
Transistor & Resistor		C1032	D-1	R1024	D-1
QR1001	C-4	C1033	D-1	R1025	D-1
QR1002	C-4	C1034	C-1	R1030	C-1
QR1004	C-2	C1035	B-1	R1031	D-1
QR1051	C-2	C1036	B-1	R1032	D-1
QR1101	C-1	C1037	C-1	R1033	D-1
Diode		C1041	D-1	R1034	D-1
D1051	C-3	C1042	A-1	R1035	C-1
D1052	C-3	C1044	C-1	R1036	C-1
D1081	D-4	C1045	A-1	R1037	C-1
D1082	C-4	C1046	B-1	R1038	B-2
D1101	C-1	C1052	C-3	R1040	C-1
D1103	C-1	C1053	C-3	R1041	D-1
D1151	C-1	C1055	B-3	R1042	D-1
D1152	C-1	C1056	C-3	R1043	C-1
Connector		C1057	C-3	R1044	C-1
FP1001	A-4	C1063	D-4	R1045	C-1
PS1001	B-2	C1064	A-3	R1050	C-3
IP		C1065	D-4	R1051	C-3
IP1001	D-4	C1066	A-4	R1052	C-3
Transformer		C1082	C-4	R1053	C-3
T1051	A-3	C1083	C-4	R1054	C-3
T1081	A-4	C1085	B-3	R1056	D-3
Coil		C1086	C-4	R1080	C-4
L1001	B-4	C1087	C-3	R1081	C-4
L1011	A-3	C1101	C-2	R1082	C-4
L1012	A-2	C1102	C-2	R1083	C-4
L1014	B-2	C1103	C-2	R1084	C-4
L1015	B-3	C1104	C-3	R1086	C-3
L1016	A-3	C1105	C-1	R1087	C-3
L1017	A-3	C1106	C-3	R1088	C-3
L1021	A-2	C1107	C-1	R1089	C-3
L1022	A-2	C1108	C-2	R1101	C-2
L1023	B-1	C1111	C-2	R1102	C-2
L1024	B-1	C1112	C-1	R1103	C-1
L1025	B-1	C1113	D-2	R1104	C-3
L1026	B-1	C1114	C-2	R1107	C-2
L1027	B-1	C1117	A-3	R1108	C-1
L1029	B-2	C1118	A-3	R1109	C-1
L1031	A-2	C1119	A-3	R1111	C-1
L1032	A-2	C1121	C-2	R1112	C-2
L1041	A-1	C1122	C-2	R1121	C-2
L1042	A-1	C1123	D-2	R1122	D-2
L1051	B-3	C1124	D-2	R1131	C-2
L1052	C-3	C1127	B-2	R1132	C-2
L1061	A-3	C1128	B-2	R1141	C-3
L1062	A-4	C1129	B-1	R1142	C-3
L1081	B-3	C1131	C-2	R1151	C-2
L1082	C-3	C1132	C-2	R1152	D-2
Capacitor		C1133	C-2	R1153	C-2
C1001	C-4	C1134	C-1	R1154	C-3
C1002	C-4	C1141	C-3	R1155	C-1
C1003	D-4	C1142	C-3	R1158	C-3
C1004	D-4	C1143	D-3	R1159	C-2
		C1144	C-3	R1181	C-3
		C1151	C-2	R1182	D-2
		C1152	C-2	R1183	C-1
		C1153	D-2	R1184	C-1
		C1154	D-2	R1186	C-3
		C1155	C-3	R1187	C-4
		C1181	C-3		
		C1182	C-3		
		C1183	D-2		

ADDRESS INFORMATION

3-15. DRIVE C.B.A. (VEP02563A)

NOTE : MULTILAYER C.B.A.
THIS C.B.A. IS Multi-Layer C.B.A. THIS CIRCUIT BOARD SHOWS COMPONENT LAYOUT-PATTERN FOR COMPONENT SIDE AND FOIL SIDE. LAYOUT-PATTERNS ARE SINGLE PATTERN FOR EACH SIDE THAT MAKE EASY TO SIGHT THE COMPONENT LAYOUT.

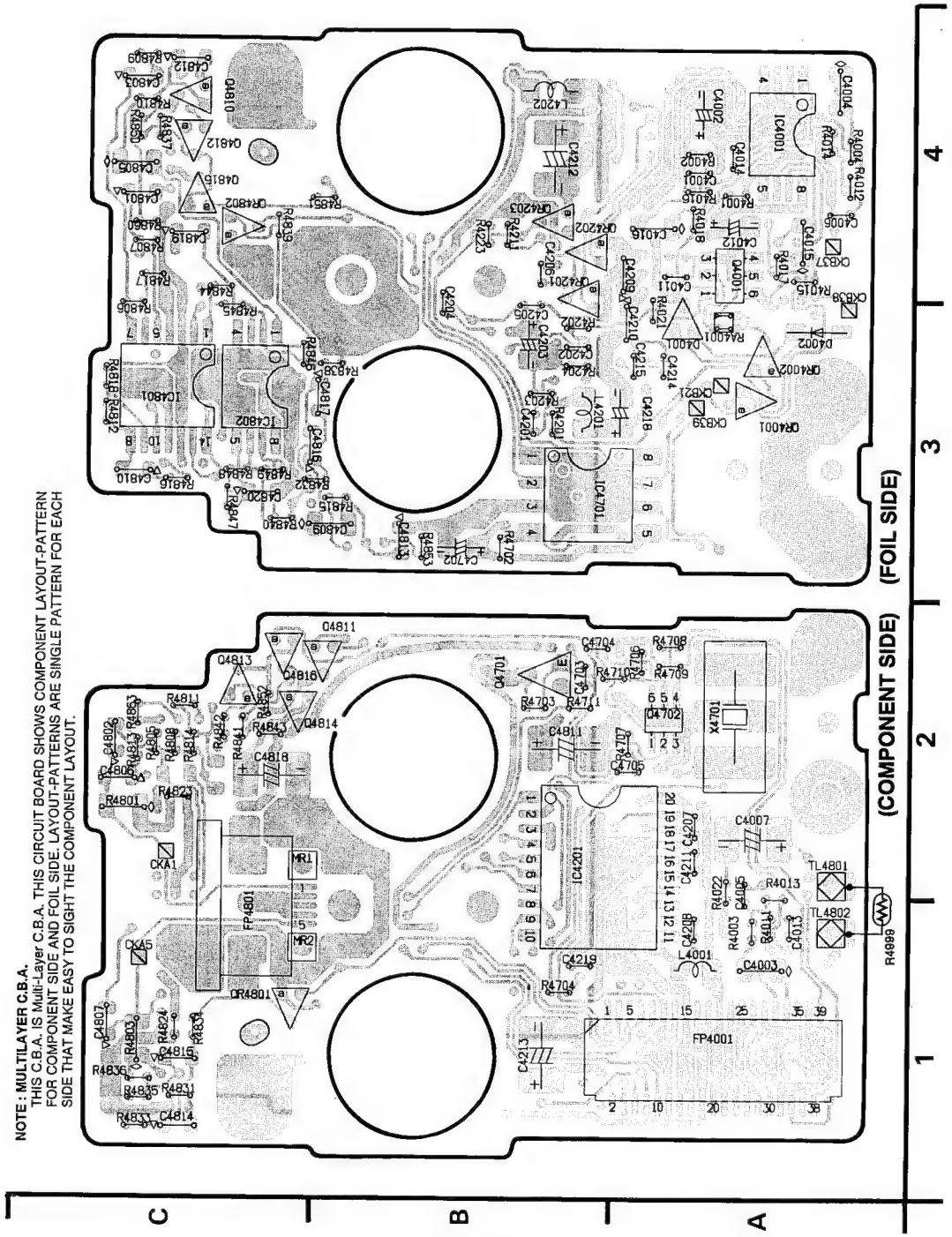


DRIVE C.B.A.	
Integrated Circuit	
IC2201	B-2
IC2202	C-2
IC2203	C-3
Connector	
FP2201	A-4
FP2202	C-5
FP2203	C-4
FP6304	C-4
PP2001	B-1
PS3801	A-2
Capacitor	
C2202	A-3
C2203	A-3
C2205	A-3
C2206	A-3
C2207	A-3
C2208	B-3
C2209	B-3
C2210	B-3
C2212	B-2
C2213	B-2
C2214	B-2
C2216	A-3
C2217	A-2
C2218	B-5
C2219	B-5
C2220	A-4
C2221	B-5
C2222	C-2
C2223	C-2
C2224	C-3
C2225	C-3
C2226	C-3
C2227	A-3
C2233	C-2
Resistor	
R2201	B-3
R2202	A-3
R2203	B-3
R2204	B-3
R2205	B-2
R2206	B-2
R2207	B-2
R2208	B-2
R2209	A-5
R2210	B-5
R2211	A-4
R2212	A-5
R2213	A-3
R2214	A-3
R2215	A-2
R2216	B-3
R2217	A-2
R2218	B-3
R6801	B-3

ADDRESS INFORMATION

Back Page:
POWER C.B.A. Section

3-16. MIC UNIT C.B.A. (VEP04736A)



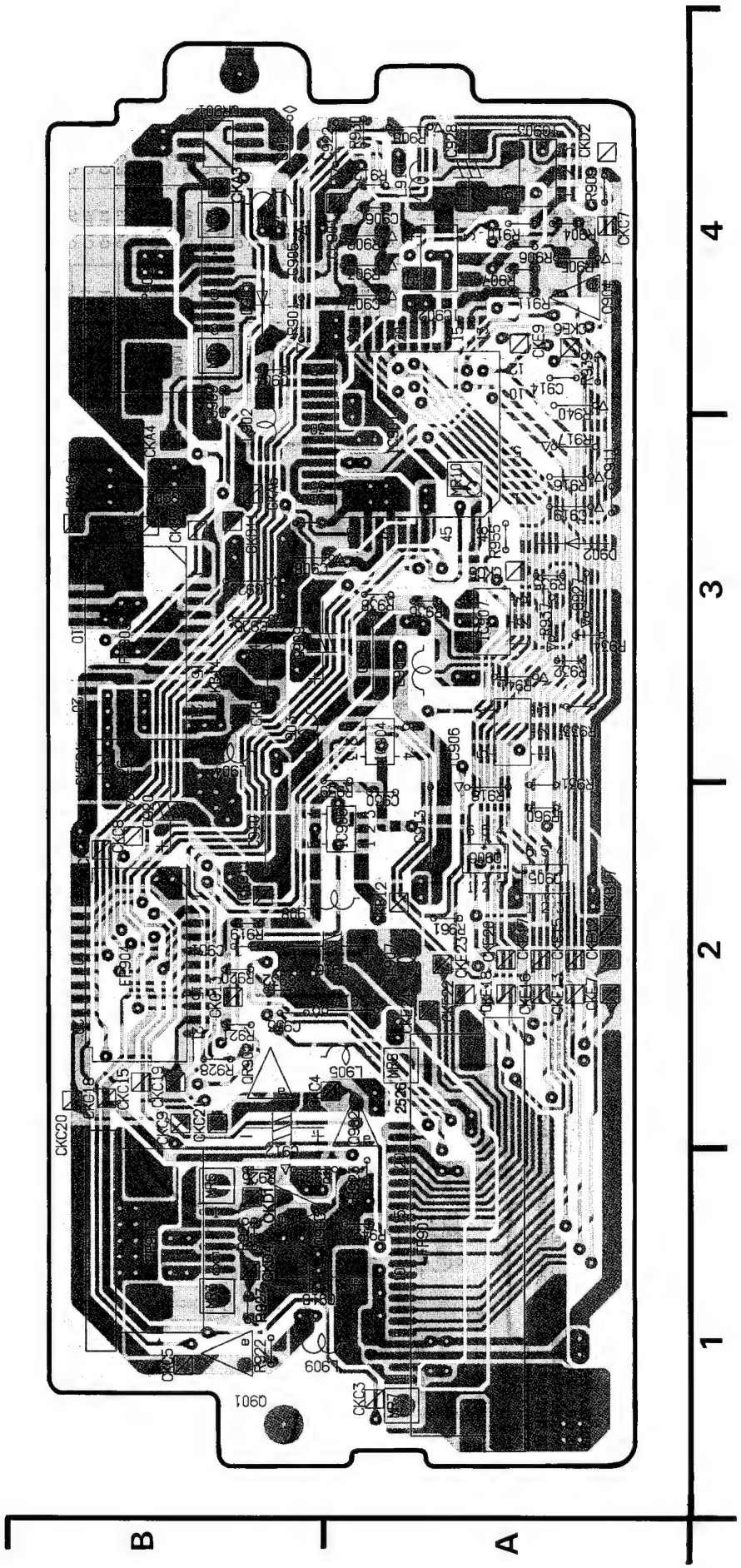
MIC UNIT C.B.A.							
Integrated Circuit			C4013	A-1	R4204	B-3
IC4001	A-4		C4014	A-4	R4211	B-4
IC4201	B-2		C4015	A-4	R4223	B-4
IC4701	B-3		C4016	A-4	R4702	B-3
IC4801	C-3		C4201	B-3	R4703	B-2
IC4802	C-3		C4202	B-3	R4704	B-1
Transistor			C4203	B-3	R4706	A-2
			C4204	B-3	R4707	A-2
Q4001	A-4		C4205	B-3	R4708	A-2
Q4701	B-2		C4206	B-4	R4709	A-2
Q4702	A-2		C4207	A-2	R4710	A-2
Q4810	C-4		C4208	A-1	R4711	B-2
Q4811	B-2		C4209	A-4	R4801	C-2
Q4812	C-4		C4210	A-3	R4803	C-4
Q4813	C-2		C4211	A-2	R4805	C-2
Q4814	C-2		C4212	B-4	R4806	C-3
Q4815	C-4		C4213	B-1	R4807	C-4
Q4816	C-2		C4214	A-3	R4808	C-2
Transistor & Resistor			C4215	A-3	R4809	C-4
			C4218	A-3	R4810	C-4
QR4001	A-3		C4219	B-1	R4811	C-2
QR4002	A-3		C4702	B-3	R4812	C-3
QR4201	B-4		C4703	B-2	R4813	C-2
QR4202	B-4		C4704	B-2	R4814	C-2
QR4203	B-4		C4705	A-2	R4815	B-3
QR4801	C-1		C4801	C-4	R4816	C-3
QR4802	C-4		C4802	C-2	R4817	C-4
Diode			C4803	C-4	R4818	C-3
			C4805	C-4	R4823	C-2
D4001	A-3		C4806	C-2	R4824	C-1
D4002	A-3		C4807	C-1	R4831	C-1
Connector			C4809	B-3	R4832	C-3
			C4810	C-3	R4833	C-1
FP4001	A-1		C4811	B-2	R4834	C-1
FP4801	C-1		C4812	C-4	R4835	C-1
Crystal Oscillator			C4813	B-3	R4836	C-1
			C4814	C-1	R4837	C-4
X4701	A-2		C4815	C-1	R4838	B-3
Coil			C4816	C-3	R4839	C-4
			C4817	B-3	R4840	C-3
L4001	A-1		C4818	C-2	R4841	C-2
L4201	B-3		C4819	C-4	R4842	C-2
L4202	B-4		C4820	C-3	R4843	C-2
Test Point			**Resistor**		R4844	C-4
					R4845	C-3
TL4801	A-2		R4001	A-4	R4846	C-3
TL4802	A-1		R4002	A-4	R4847	C-3
Capacitor			R4003	A-1	R4848	C-3
			R4004	A-4	R4849	C-3
C4001	A-4		R4011	A-1	R4850	C-4
C4002	A-4		R4012	A-4	R4851	B-4
C4003	A-1		R4013	A-2	R4852	C-2
C4004	A-4		R4014	A-2	R4853	B-3
C4005	A-1		R4015	A-4	R4860	C-4
C4006	A-4		R4016	A-4	R4863	C-2
C4007	A-2		R4017	A-4	**Resistor Array**	
C4011	A-4		R4018	A-4		
C4012	A-4		R4021	A-3	RA4001	A-3
			R4022	A-2		
			R4201	B-3		
			R4202	B-3		
			R4203	B-3		

ADDRESS INFORMATION

3-17. MONITOR C.B.A. (VEP26204B)

MONITOR C.B.A.			
Integrated Circuit		**Transistor & Resistor**	
IC901	A-3	QR901	B-4
IC902	A-4	QR902	B-2
IC903	A-4		
IC904	A-3	**Connector**	
IC905	A-2	FP901	A-1
IC906	A-3	FP902	B-4
IC907	A-3	FP903	B-3
		FP904	B-2
Transistor		FP905	B-1
Q901	B-1		
Q902	A-2	**Test Point**	
Q903	B-1	CL901	A-4
Q904	A-4		
Q905	A-2		
Q906	A-2		

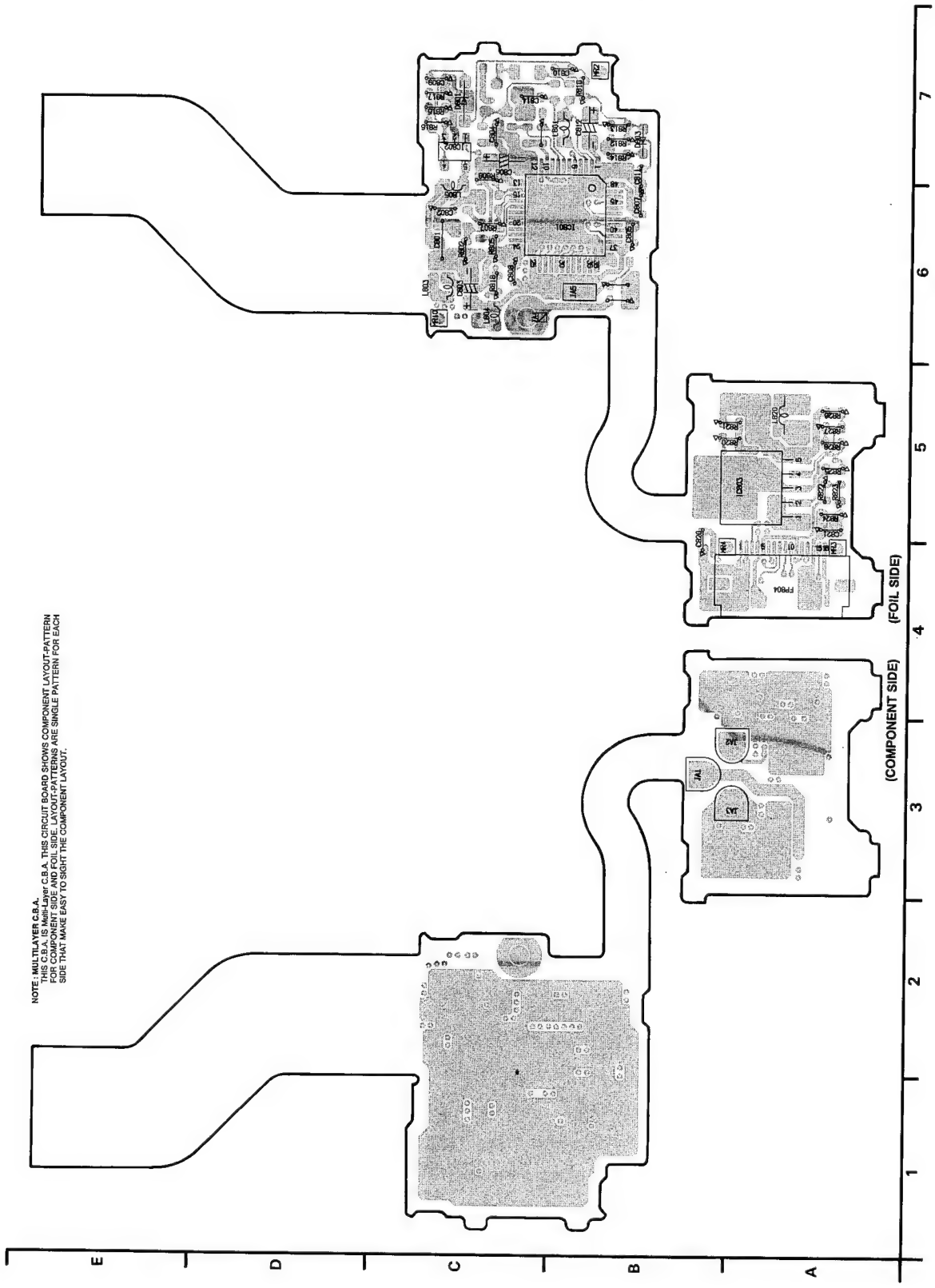
ADDRESS INFORMATION



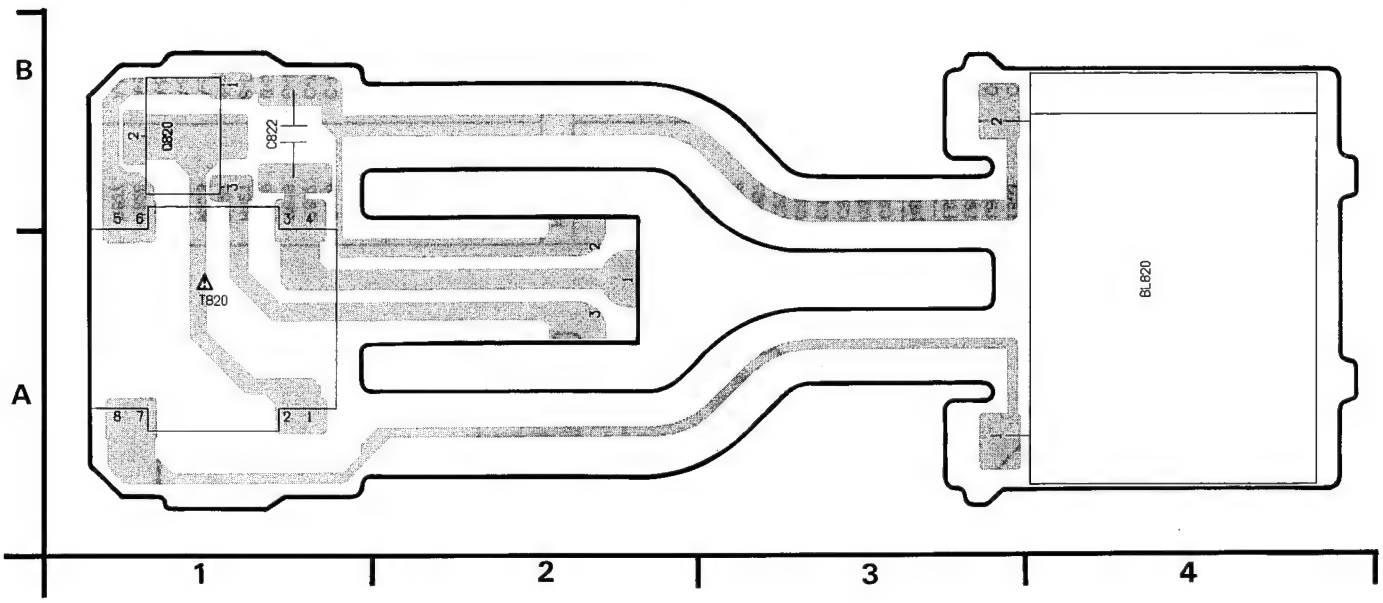
3-18. E.V.F. (A) C.B.A. (VEP28254B)

E.V.F. (A) C.B.A.	
Integrated Circuit	
IC801	B-6
IC802	C-7
IC803	A-5
Diode	
D801	C-7
D803	B-7
Connector	
FP804	A-4
Coil	
L801	B-7
L803	C-6
L804	C-6
L805	C-6
L820	A-5
Capacitor	
C801	C-6
C802	C-6
C803	C-6
C804	C-7
C805	B-6
C806	C-7
C807	B-6
C808	C-6
C809	C-7
C810	B-7
C811	B-7
C812	B-7
C814	C-7
C820	B-5
C821	A-5
Resistor	
R802	C-6
R805	C-6
R807	C-6
R808	C-7
R810	B-7
R812	B-7
R813	B-7
R814	B-7
R815	C-7
R816	C-7
R817	C-7
R818	C-6
R820	B-5
R821	B-5
R822	A-5
R823	A-5
R824	A-5
R825	A-5
R826	A-5
R827	A-5
R828	A-5

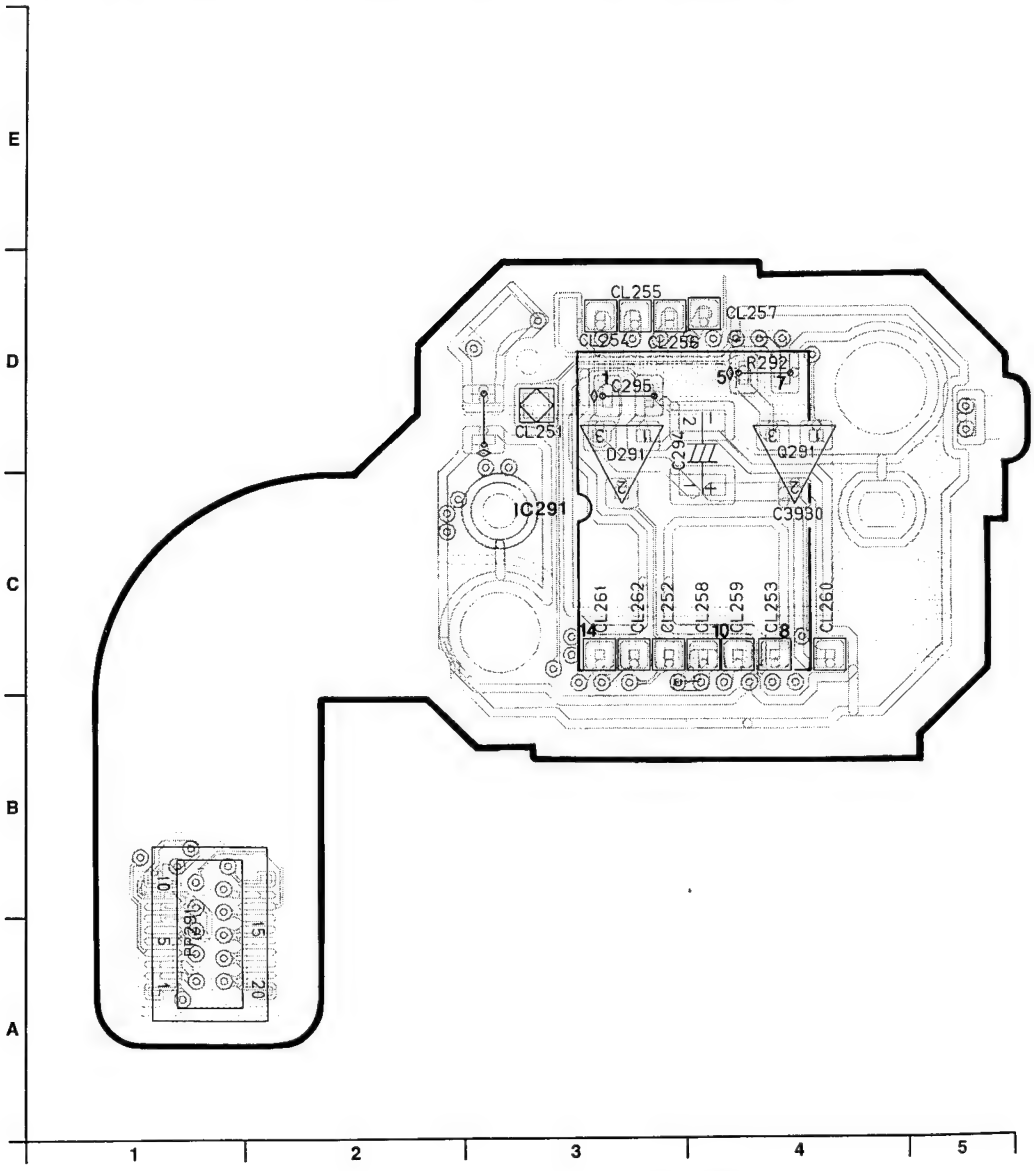
ADDRESS INFORMATION



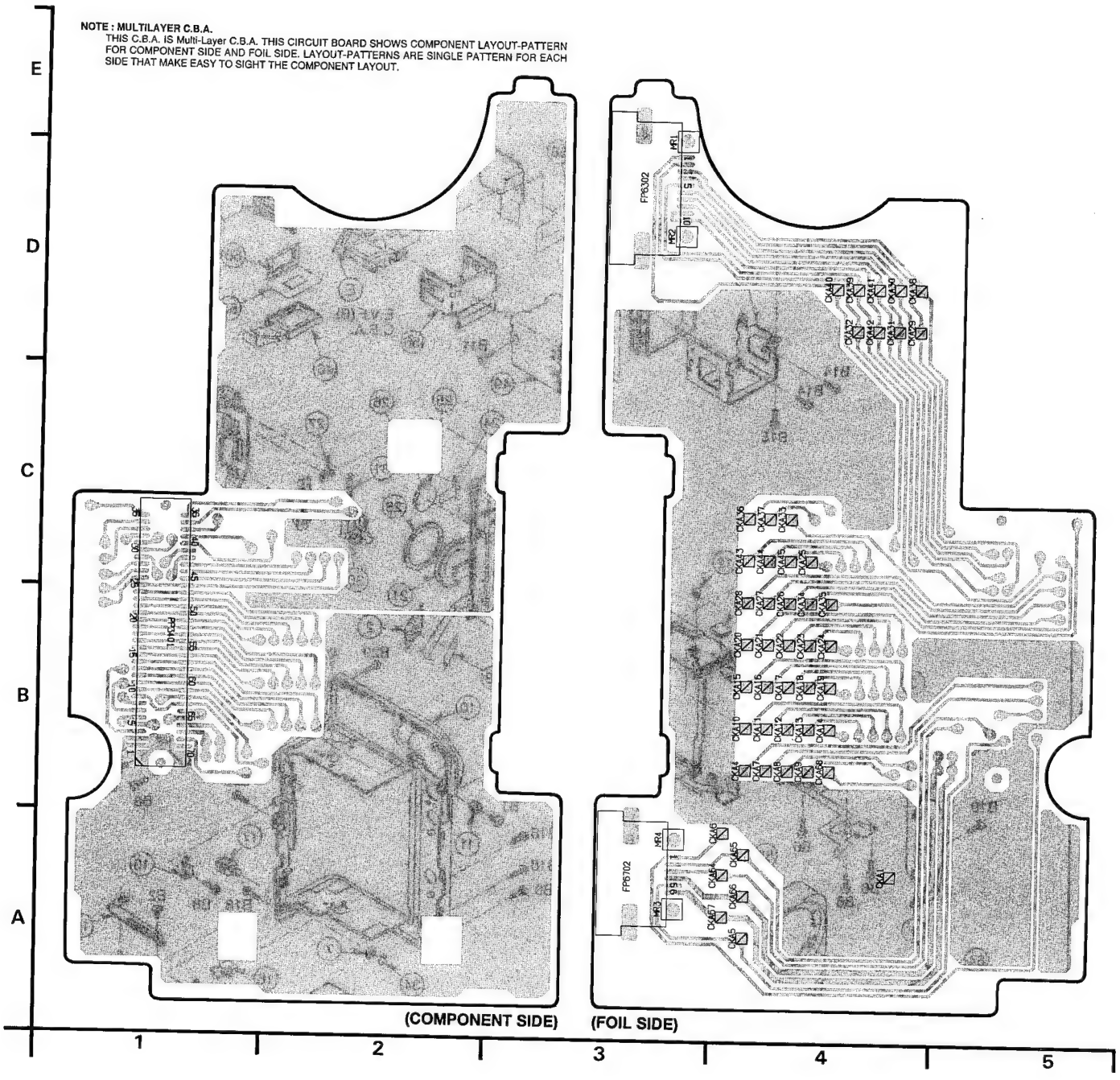
3-19. E.V.F. (B) C.B.A. (VEP28255A)



3-20. CCD FLEX. CARD C.B.A. (VEP22279A)



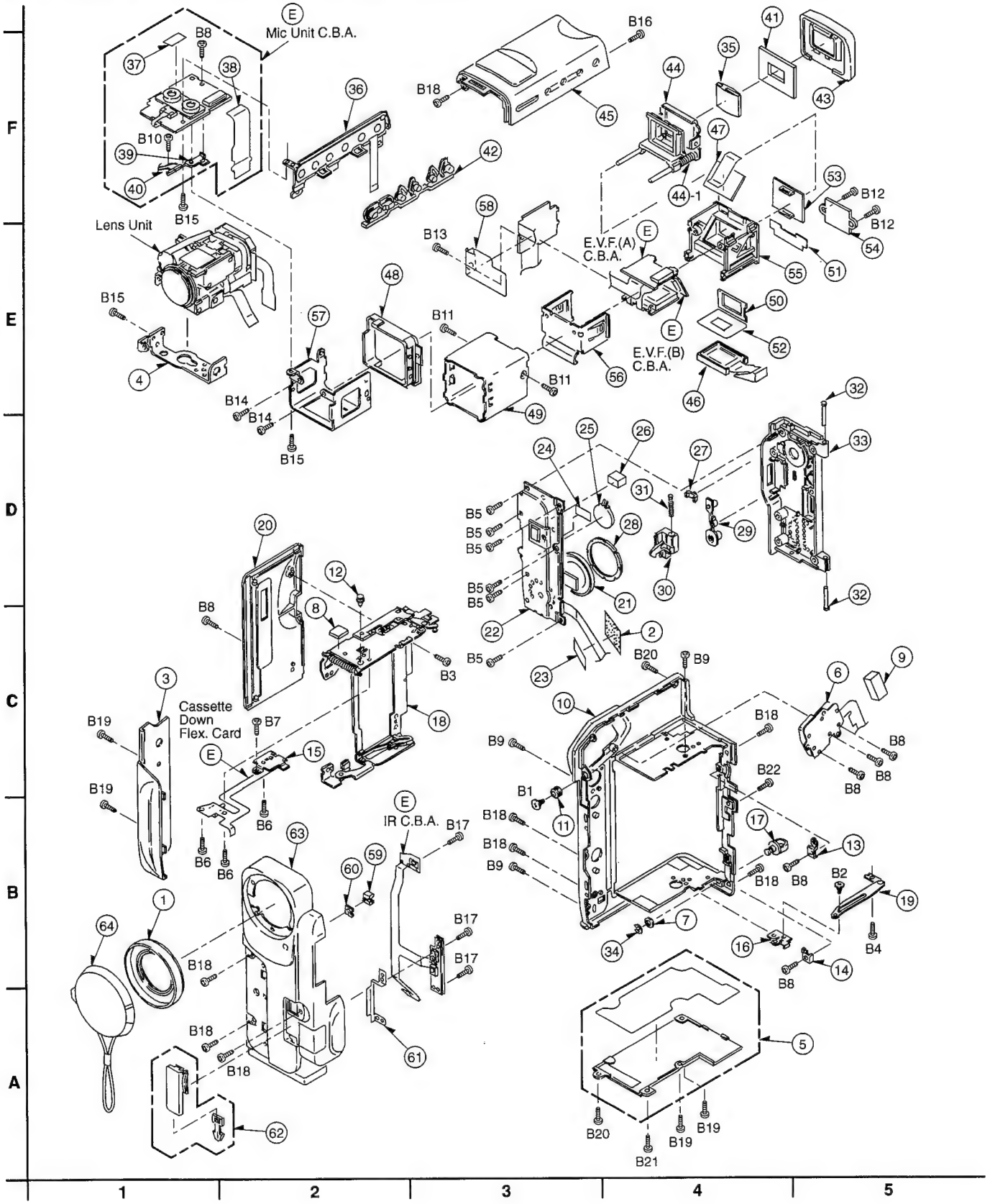
3-21. OPERATION I/F C.B.A. (VEP23479A)



SECTION 4 EXPLODED VIEWS & PARTS LIST

4-1. EXPRODED VIEWS & MECHANICAL REPLACEMENT PARTS LIST

❶ FRAME & CASING PARTS SECTION (1)

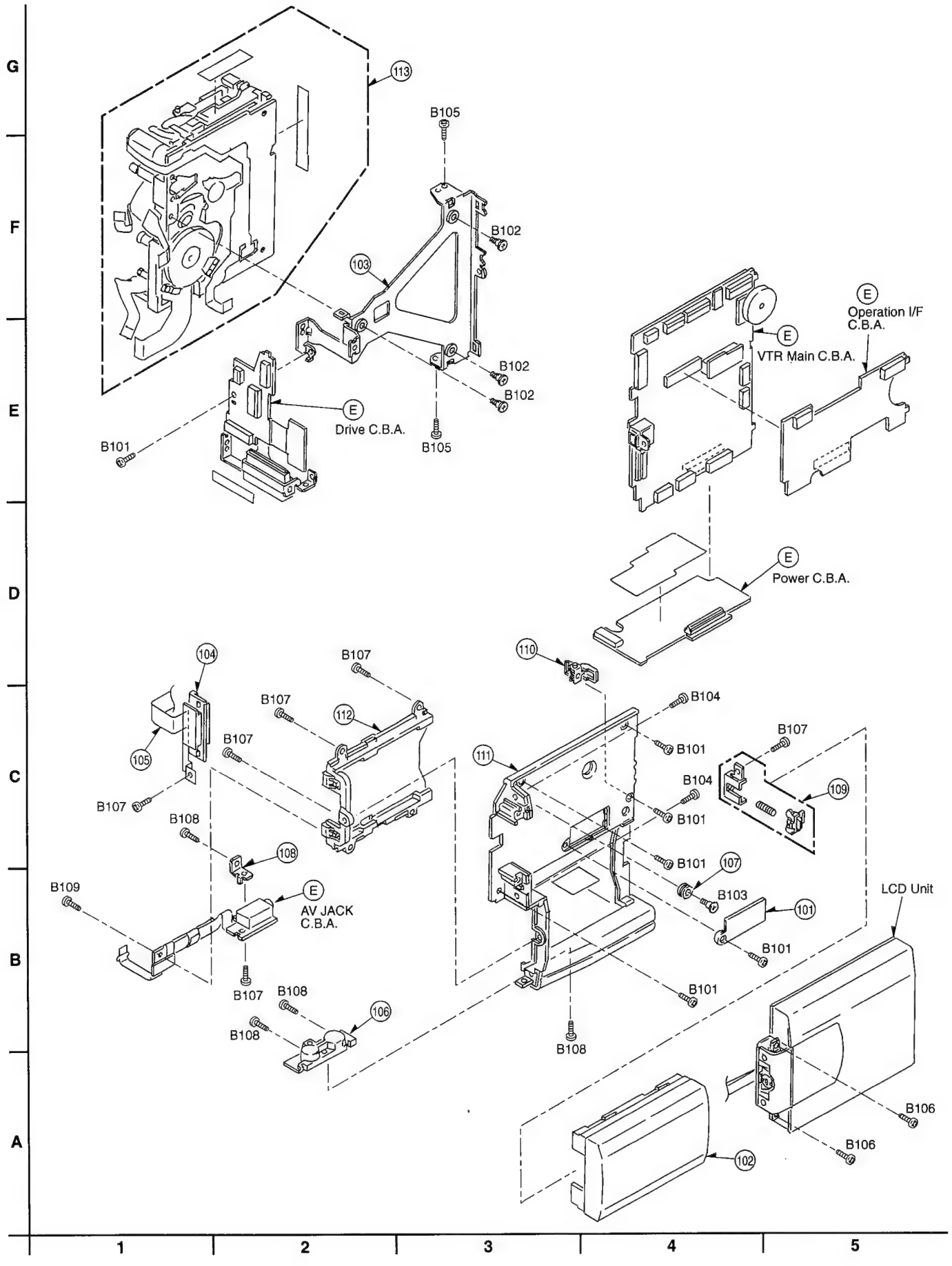


Note: 1. *Be sure to make your orders of replacement parts according to this list.
2. IMPORTANT SAFETY NOTICE
Components identified with the mark ⚠ have the special characteristics for safety. When replacing any of these components, use only the same type.

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
1 (1)	VYF2592	MC PROTECTOR ASS'Y	1	
2 (1)	VGQ4640	PROTECT SHEET	1	
3 (1)	VGQ4939	GRIP COVER	1	
4 (1)	VMP5686	LENS FIXING ANGLE	1	
5 (1)	VYK8484	BOTTOM CASE ASS'Y	1	
6 (1)	VEK8397	ZOOM OPERATION ASS'Y	1	
7 (1)	VGQ4953	HANDSTRAP SPACER	1	
8 (1)	VGQ5021	LENS CUSHION	1	
9 (1)	VGQ5193	LENS SIDE CUSHION	1	
10 (1)	VKM5119	SIDE CASE (L)	1	
11 (1)	VMG1135	LENS DUMPER RUBBER	1	
12 (1)	VMG1139	LENS RECEIVE RUBBER	1	
13 (1)	VMP5671	SHAFT FIXING PIECE (A)	1	
14 (1)	VMP5675	SHAFT FIXING PIECE (B)	1	
15 (1)	VMP5677	SW ANGLE	1	
16 (1)	VMP5678	CLICK PLATE	1	
17 (1)	VMS6440	HANDSTRAP ANGLE	1	
18 (1)	VXA6188	OUTHOLDER ASS'Y	1	
19 (1)	VXL2845	COVER LINK ASS'Y	1	
20 (1)	VYP7207	CASSETTE COVER ASS'Y	1	
21 (1)	EAS2P113D	SPEAKER	1	
22 (1)	VEK8529	REAR OPERATION (1) ASS'Y	1	
23 (1)	VGQ5128	REAR OPERATION BARRIER	1	
24 (1)	VGQ5177	BOTH SIDES TAPE	1	
25 (1)	VL1220/1FC	LITHIUM BATTERY	1	
26 (1)	VMG1175	PREVENTION SHEET	1	
27 (1)	VGL0801	PANEL LIGHT	1	
28 (1)	VGQ4925	SPEAKER SHEET	1	
29 (1)	VGU7874	MENU/PHOTO SHOT BUTTON	1	
30 (1)	VGU7877	DOOR LOCK KNOB	1	
31 (1)	VMB3262	DOOR LOCK SPRING	1	
32 (1)	VMS6431	DOOR LOCK SHAFT	2	
33 (1)	VYQ1657	REAR DOOR (1) ASS'Y	1	
34 (1)	XUC2FP	E-RING	1	
35 (1)	VDL0737	EVF LENS	1	
36 (1)	VEK8395	VTR OPERATION ASS'Y	1	
37 (1)	VGQ5120	PROTECT SHEET	1	
38 (1)	VJB04712	AUDIO FLEX.	1	
39 (1)	VMP5673	DEW FIXING ANGLE	1	
40 (1)	VEK8428	DEW SENSOR ASS'Y	1	
41 (1)	VGQ5258	EVF LENS SHEET	1	
42 (1)	VGU8139	VTR OPERATION BUTTON	1	
43 (1)	VMG1132	EYE CAP	1	
44 (1)	VYK8486	EVF ADJUSTMENT ASS'Y	1	
44-1 (1)	VMB3266	SPRING	1	
45 (1)	VYK8752	TOP CASE (1) ASS'Y	1	
46 (1)	F05KM200	LCD PANEL	1	
47 (1)	VDL0851	EVF REFLECTOR	1	
48 (1)	VGQ4933	EVF GUIDE HOLDER	1	
49 (1)	VGQ4935	EVF SLIDE ANGLE	1	
50 (1)	VGQ4974	BARRIER WINDOW	1	
51 (1)	VGQ5020	BARRIER SHEET	1	
52 (1)	VGQ5141	LCD MASK	1	
53 (1)	VGQ5205	EVF PROTECT COVER	1	
54 (1)	VGQ5255	EVF PROTECT COVER SHEET	1	
55 (1)	VKM4989	EVF CASE	1	
56 (1)	VMC1459	EVF CLICK SPRING	1	
57 (1)	VMP5674	EVF GUIDE FRAME	1	
58 (1)	VMZ2837	EVF BARRIER	1	
59 (1)	VGL0802	TALLY PANEL LIGHT	1	
60 (1)	VGQ5095	TALLY PIECE	1	
61 (1)	VMP5672	REFLECT PLATE	1	
62 (1)	VYF2578	DV JACK COVER ASS'Y	1	
63 (1)	VYK8761	FRONT CASE (1) ASS'Y	1	
64 (1)	VYP7015	HOOD CAP ASS'Y	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
B1 (1)	VHD1180	SCREW	1	
B2 (1)	VHD1191	SCREW	1	
B3 (1)	VHD1209	SCREW	1	
B4 (1)	VHD1222	SCREW	1	
B5 (1)	VHD1209	SCREW	6	
B6 (1)	XQN14+B12	SCREW	3	
B7 (1)	XQN16+B15FZ	SCREW	1	
B8 (1)	XQN16+B2FZ	SCREW	7	
B9 (1)	XQN16+B25	SCREW	3	
B10 (1)	XQN2+B2	SCREW	1	
B11 (1)	VHD1208	SCREW	2	
B12 (1)	XQN16+BJ4FZ	SCREW	2	
B13 (1)	XQN16+B15	SCREW	1	
B14 (1)	XQS16+AJ3	SCREW	2	
B15 (1)	XQN16+BJ3FZ	SCREW	3	
B16 (1)	XQN16+B3FB	SCREW	1	
B17 (1)	XQN16+BJ4FB	SCREW	3	
B18 (1)	XQN16+B25FB	SCREW	8	
B19 (1)	XQN16+B3FZ	SCREW	4	
B20 (1)	XQN16+B4FZ	SCREW	2	
B21 (1)	XQN16+B5FZ	SCREW	1	
B22 (1)	XQN16+B6FB	SCREW	1	

❷ FRAME & CASING PARTS SECTION (2)

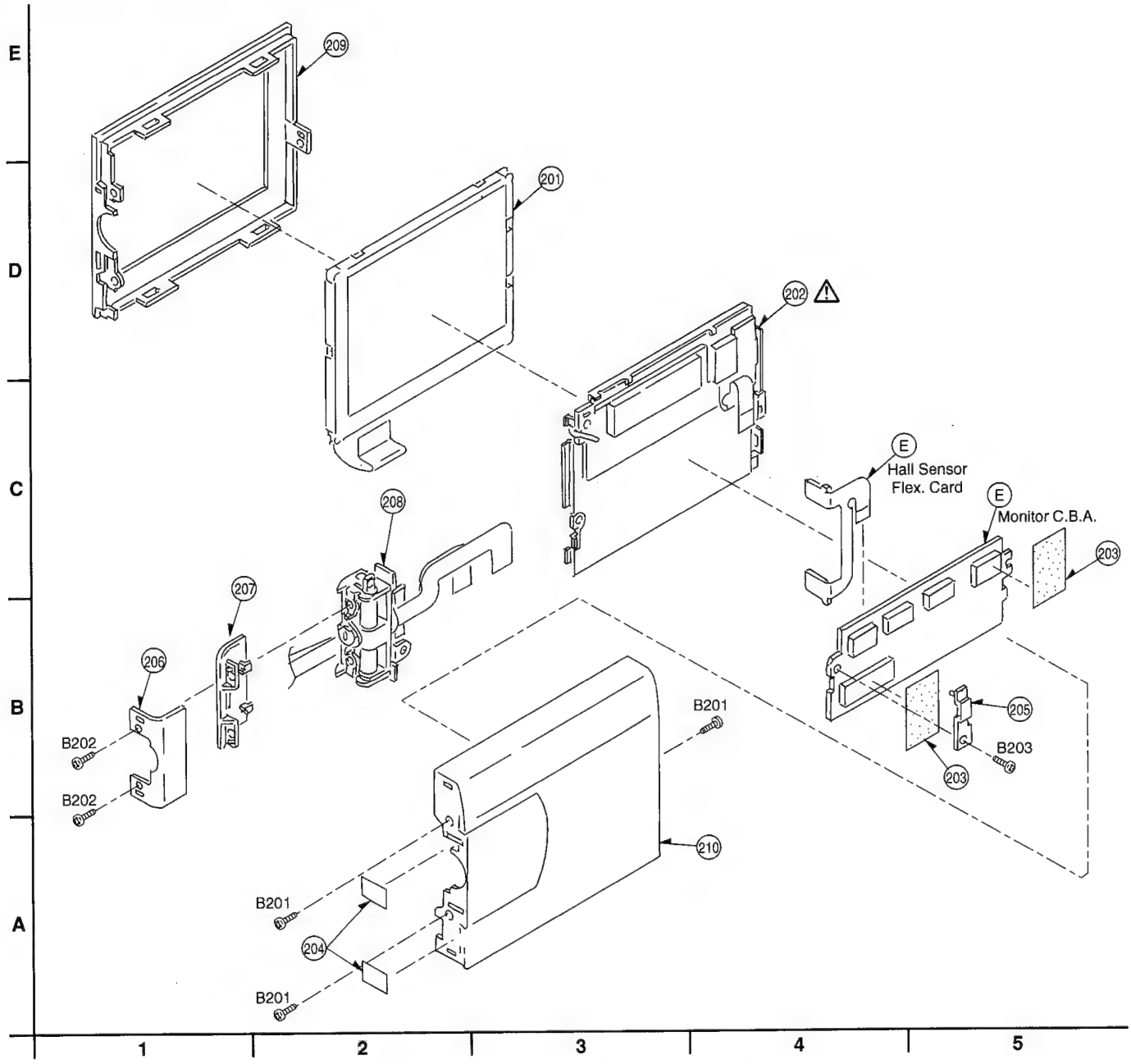


Note: 1. *Be sure to make your orders of replacement parts according to this list.
2. IMPORTANT SAFETY NOTICE
Components identified with the mark ⚠ have the special characteristics for safety. When replacing any of these components, use only the same type.

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
101 (2)	VKF3017	EVR COVER	1	
102 (2)	VKM5100	DUMMY BATTERY CASE ASS'Y	1	
103 (2)	VYQ1567	MECHA. FRAME ASS'Y	1	
104 (2)	VEK8426	BATTERY CATCHER	1	
105 (2)	VWJ1252	BATTERY CATCHER FLEX.	1	
106 (2)	VMD3059	TRIPOD FRAME	1	
107 (2)	VMG1135	LENS DUMPER RUBBER	1	
108 (2)	VMP5665	JACK FIXING ANGLE	1	
109 (2)	VXU1513	BATTERY LOCK ASS'Y	1	
110 (2)	VXU1514	LCD LOCK ASS'Y	1	
111 (2)	VYK8756	SIDE CASE (R) 2 ASS'Y	1	
112 (2)	VYK8712	BATTERY FIXING PLATE ASS'	1	
113 (2)	VXY1340	MECHA. ASS'Y	1	
B101 (2)	XQN16+B25FZ	SCREW	6	
B102 (2)	VHD1133	SCREW	3	
B103 (2)	VHD1252	SCREW	1	
B104 (2)	XQN16+BJ6FZ	SCREW	2	
B105 (2)	XQS16+A2	SCREW	2	
B106 (2)	VHD1119	SCREW	2	
B107 (2)	XQN16+B2FZ	SCREW	6	
B108 (2)	XQN16+B4FZ	SCREW	4	
B109 (2)	XQN16+B6FZ	SCREW	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks

❸ LCD PARTS SECTION

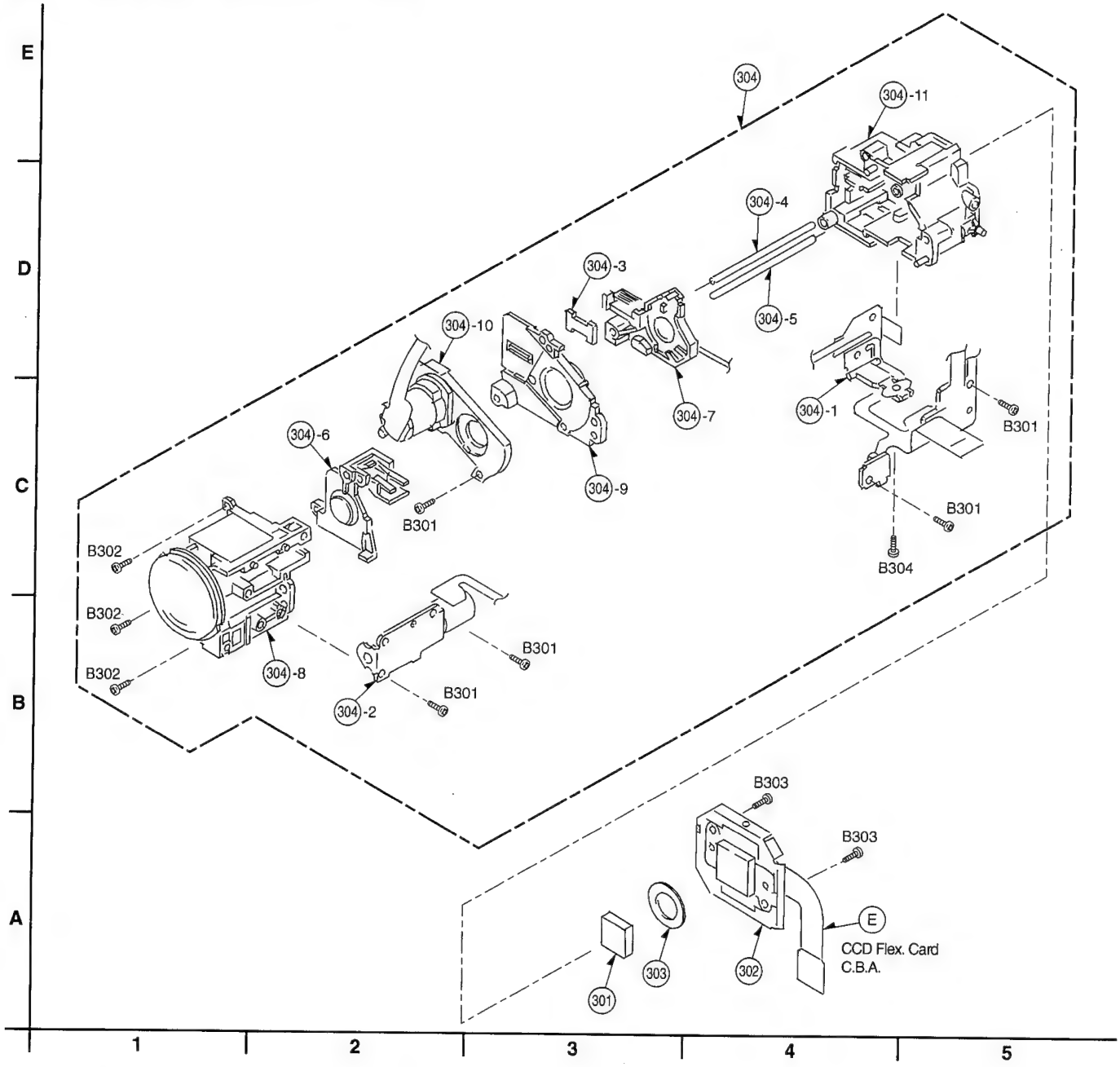


Note: 1. *Be sure to make your orders of replacement parts according to this list.
2. IMPORTANT SAFETY NOTICE
Components identified with the mark ⚠ have the special characteristics for safety. When replacing any of these components, use only the same type.

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
201 (3)	COD25T2021VB	LCD PANEL	1	
⚠ 202 (3)	VEK8420	BACK LIGHT ASS'Y	1	
203 (3)	VGQ2759	SHEET	2	
204 (3)	VGQ5202	BARRIER SHEET	2	
205 (3)	VGQ4928	LCD FLEX. FIXING PIECE	1	
206 (3)	VGQ5281	HINGE TOP COVER	1	
207 (3)	VGQ5282	HINGE BOTTOM COVER	1	
208 (3)	VXD0286	LCD ROTARY HINGE (1) ASS'	1	
209 (3)	VKM5124	LCD BOTTOM CASE	1	
210 (3)	VYK8758	LCD TOP CASE ASS'Y	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
B201 (3)	VHD1253	SCREW	3	
B202 (3)	VHD1209	SCREW	2	
B203 (3)	XQN16+B4FZ	SCREW	1	

❹ CAMERA LENS SECTION

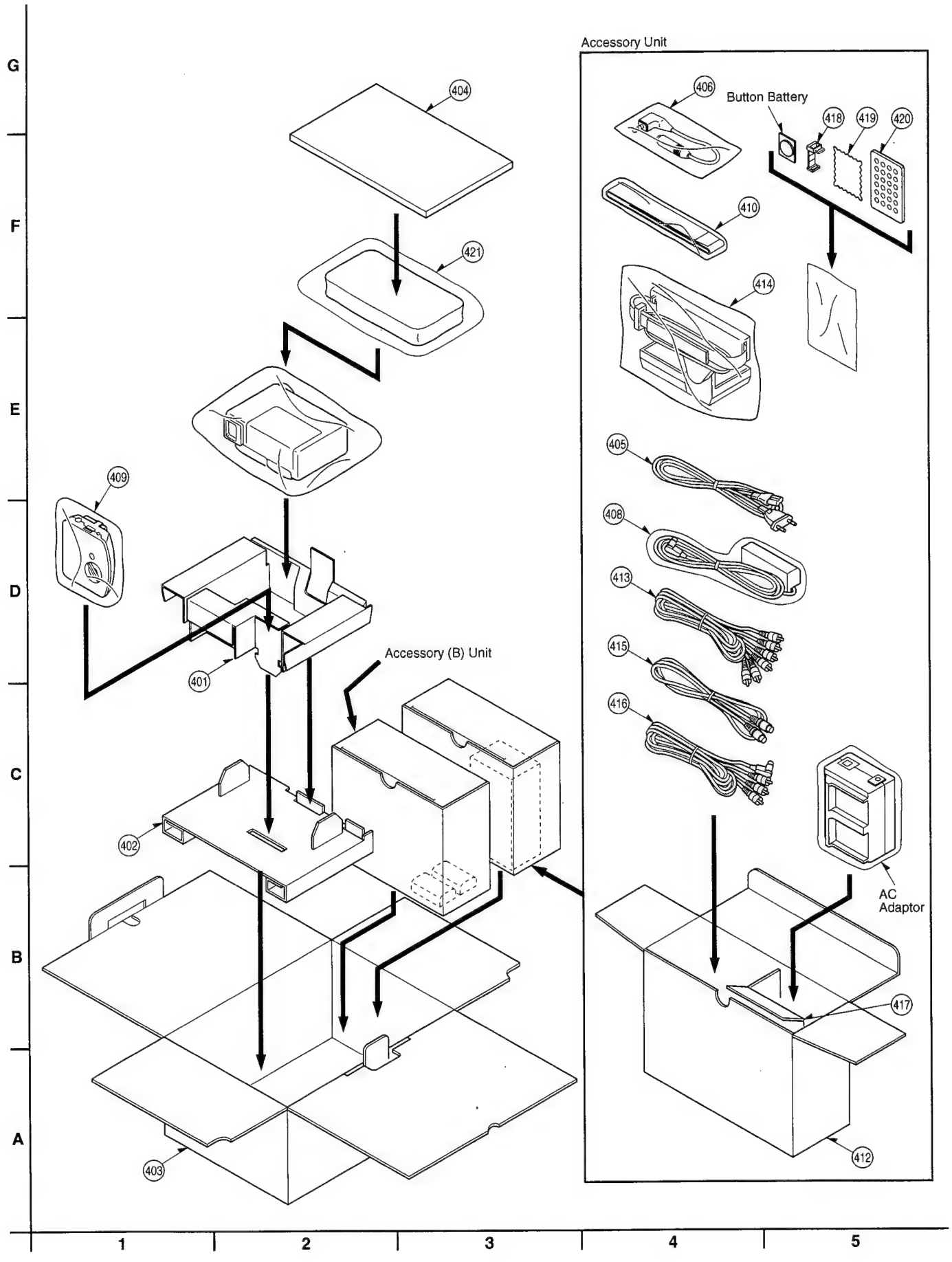


Note: 1. *Be sure to make your orders of replacement parts according to this list.
2. IMPORTANT SAFETY NOTICE
Components identified with the mark ⚠ have the special characteristics for safety. When replacing any of these components, use only the same type.

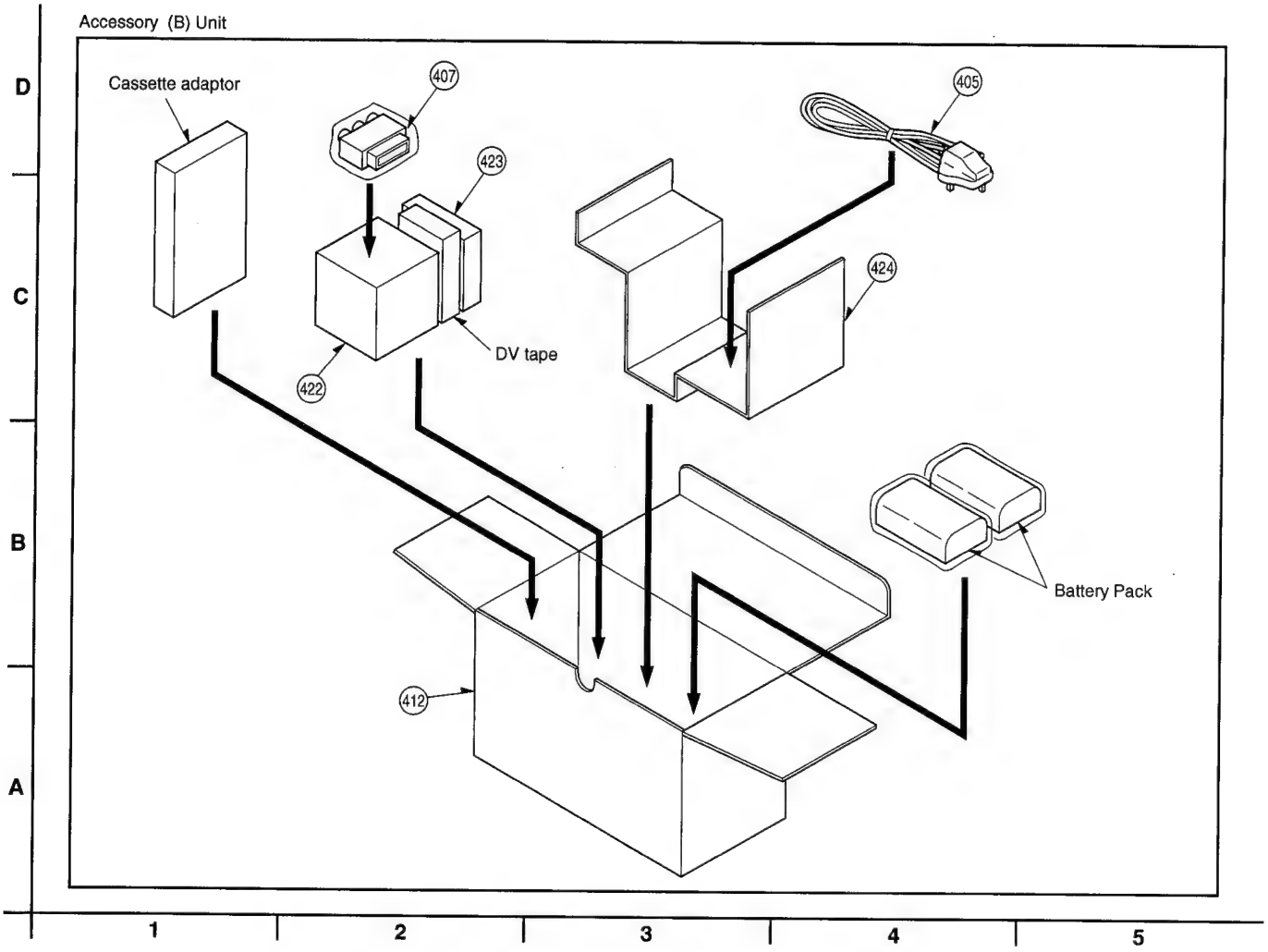
Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
301 (4)	VDL0916	CRYSTAL FILTER	1	
302 (4)	VEK8530	CCD ASS'Y	1	
303 (4)	VMX2758	CCD CUSHION	1	
304 (4)	VXW0403	LENS ASS'Y	1	
304-1 (4)	VEK8456	LENS FLEX. CARD C. B. A.	1	
304-2 (4)	VEM0653	ZOOM MOTOR ASS'Y	1	
304-3 (4)	VMA9961	SIDE YOKE	1	
304-4 (4)	VMS6418	GUIDE POLE	1	
304-5 (4)	VMS6487	GUIDE POLE (A)	1	
304-6 (4)	VXP1886	2ND MOVING FRAME ASS'Y	1	
304-7 (4)	VXP1887	4TH MOVING FRAME ASS'Y	1	
304-8 (4)	VXQ0730	MAIN FRAME ASS'Y	1	
304-9 (4)	VXQ0762	3RD LENS FRAME ASS'Y	1	
304-10 (4)	VXL2834	IRIS ASS'Y	1	
304-11 (4)	VXQ0752	MASTER FLANGE ASS'Y	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
B301 (4)	XQN16+BJ5	SCREW	5	
B302 (4)	XQN16+BJ8	SCREW	3	
B303 (4)	XQN16+CJ4FY	SCREW	2	
B304 (4)	XQN16+BJ4FY	SCREW	1	

❺ PACKING PARTS & ACCESSORIES SECTION



Accessory (B) Unit



Note: 1. *Be sure to make your orders of replacement parts according to this list.
2. IMPORTANT SAFETY NOTICE
Components identified with the mark ⚠ have the special characteristics for safety. When replacing any of these components, use only the same type.

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
401 (5)	VPN4995	CUSHION (UPPER)	1	
402 (5)	VPN4996	CUSHION (LOWER)	1	
403 (5)	VPK2218	PACKING	1	
⚠ 404 (5)	VQT7769	OPERATING INSTRUCTIONS	1	
⚠ 404 (5)	VQT7770	OPERATING INSTRUCTIONS	1	
⚠ 405 (5)	VJA0664	AC CORD	1	
⚠ 405 (5)	VJA0940	AC CORD	1	
406 (5)	VFA0292	HEADPHONE CONV. ADAPTOR	1	
407 (5)	VFA0151	21PIN ADAPTOR	1	
408 (5)	VEK8588	DC CABLE ASS'Y	1	
409 (5)	VSK0540	OUTPUT TERMINAL BOX	1	
410 (5)	VYC0777	HAND STRAP	1	
412 (5)	VPN4948	ACCESSORIES PACKING	1	
413 (5)	VJA0788	AV OUTPUT CABLE	1	
414 (5)	VYK8705	HAND GRIP	1	
415 (5)	VJA0658	S-VHS CABLE	1	
416 (5)	VJA1028	AV 4PIN CABLE	1	
417 (5)	VPN4949	PAD	1	
418 (5)	VGQ5094	HOOD CAP FIXING PIECE	1	
419 (5)	VFC1792	LENS CLEANER	1	
420 (5)	VEQ2141	REMOTE CONTROLLER ASS'Y	1	
421 (5)	VFC2924	SOFT CASE	1	
422 (5)	VYQ1479	WIDE CONVERSION LENS	1	
423 (5)	VYQ1510	ND FILTER	1	
424 (5)	VPN5141	PAD	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks

4-2. ELECTRICAL REPLACEMENT PARTS LIST

Note: 1. Be sure to make your orders of replacement parts according to this list.
2. IMPORTANT SAFETY NOTICE: Components identified with the mark ⚠ have the special characteristics for safety. When replacing any of these components, use only the same type.
3. Unless otherwise specified,
All resistors are in OHMS, K=1,000 OHMS. All capacitors are in MICROFARADS (uf), P=uuF.
4. The P.C. Board units marked width "■" show below the main assembled parts.
5. The marking (RTL) indicaters the retention time is limited for this item.
After the discontinuation of this assembly in production, it will no longer be available.

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
■	VEP03E58B	VTR/MAIN C. B. A.	1	(RTL)
■	VEP01827B	POWER C. B. A.	1	(RTL)
■	VEP02563A	DRIVE C. B. A.	1	(RTL)
■	VEP23479A	OP IF C. B. A.	1	(RTL)
■	VEP00Z62A	C. D DET. FLEX CARD C. B. A.	1	(RTL)
■	VEP04736A	MIC UNIT C. B. A.	1	(RTL)
■	VEP04713A	ECM FPC C. B. A.	1	(RTL)FOR VEP04736A
■	VEP28254B	E. V. F. (A) C. B. A.	1	(RTL)
■	VEP28255A	E. V. F. (B) C. B. A.	1	(RTL)
■	VEP00Z58A	AV JACK C. B. A.	1	(RTL)
■	VEP06C60A	HALL SENSOR FLEX. CARD C. B. A	1	(RTL)
■	VEP26204B	MONITOR C. B. A.	1	(RTL)
■	VEP00Z59A	IR C. B. A.	1	(RTL)
■	VEP22279A	CCD FLEX. CARD C. B. A.	1	(RTL)
■	VEK8456	LENS FLEX. CARD C. B. A.	1	(RTL)

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
■	VEP01827B	POWER C. B. A.	1	(RTL)
C1001-04	ECUX1C106VBP	C. CAPACITOR CH 16V 10U	4	
C1005	ECUX1A335KBM	C. CAPACITOR CH 10V 3. 3P	1	
C1011	ECUX1C104KBV	C. CAPACITOR CH 16V 0. 1U	1	
C1012	ECUX1A335KBM	C. CAPACITOR CH 10V 3. 3P	1	
C1013	ECUX1E331KBQ	C. CAPACITOR CH 25V 330P	1	
C1014	ECUX1C223KBQ	C. CAPACITOR CH 16V 0. 022U	1	
C1015	VCS0JN106	E. CAPACITOR 6. 3V 10M	1	
C1016	ECUX1A105KBN	C. CAPACITOR CH 10V 1U	1	
C1018, 19	ECUX1A105KBN	C. CAPACITOR CH 10V 1U	2	
C1021	ECUX1C104KBV	C. CAPACITOR CH 16V 0. 1U	1	
C1022	ECUX1A335KBM	C. CAPACITOR CH 10V 3. 3P	1	
C1023	ECUX1E331KBQ	C. CAPACITOR CH 25V 330P	1	
C1024	ECUX1C223KBQ	C. CAPACITOR CH 16V 0. 022U	1	
C1025	VCS0JN106	E. CAPACITOR 6. 3V 10M	1	
C1026-29	ECUX1A105KBN	C. CAPACITOR CH 10V 1U	4	
C1031	ECUX1C104KBV	C. CAPACITOR CH 16V 0. 1U	1	
C1032	ECUX1A335KBM	C. CAPACITOR CH 10V 3. 3P	1	
C1033	ECUX1E102KBQ	C. CAPACITOR CH 25V 1000P	1	
C1034	ECUX1C103KBQ	C. CAPACITOR CH 16V 0. 01U	1	
C1035	VCS0JN106	E. CAPACITOR 6. 3V 10M	1	
C1036	ECUX1A105KBN	C. CAPACITOR CH 10V 1U	1	
C1037	VCS0JN106	E. CAPACITOR 6. 3V 10M	1	
C1041	ECUX1C104KBV	C. CAPACITOR CH 16V 0. 1U	1	
C1042	ECUX1A335KBM	C. CAPACITOR CH 10V 3. 3P	1	
C1044	ECUX1C223KBQ	C. CAPACITOR CH 16V 0. 022U	1	
C1045	VCS0JN106	E. CAPACITOR 6. 3V 10M	1	
C1046	ECUX1A105KBN	C. CAPACITOR CH 10V 1U	1	
C1052	ECUX1E105KBM	C. CAPACITOR CH 25V 1U	1	
C1053	ECUX1E222KBQ	C. CAPACITOR CH 25V 2200P	1	
C1055	ECUX1C225KBM	C. CAPACITOR CH 16V 2. 2U	1	
C1056, 57	ECUX1A105KBN	C. CAPACITOR CH 10V 1U	2	
C1063, 64	ECUX1A225KBM	C. CAPACITOR CH 10V 2. 2U	2	
C1065, 66	ECUX1A105KBN	C. CAPACITOR CH 10V 1U	2	
C1082	ECUX1E105KBM	C. CAPACITOR CH 25V 1U	1	
C1083	ECUX1E222KBQ	C. CAPACITOR CH 25V 2200P	1	
C1085	ECUX1C106VBP	C. CAPACITOR CH 16V 10U	1	
C1086, 87	ECUX1E105KBM	C. CAPACITOR CH 25V 1U	2	
C1101	ECUX1H101JCQ	C. CAPACITOR CH 50V 100P	1	
C1102	ECUM1C334KBN	C. CAPACITOR CH 16V 0. 33U	1	
C1103	ECUX1A473KBQ	C. CAPACITOR CH 10V 0. 047U	1	
C1104	ECUX1A104KBQ	C. CAPACITOR CH 10V 0. 1U	1	
C1105	ECUX1A105KBN	C. CAPACITOR CH 10V 1U	1	
C1106	ECUX1A104KBQ	C. CAPACITOR CH 10V 0. 1U	1	
C1107	ECUX1A105KBN	C. CAPACITOR CH 10V 1U	1	
C1108	ECUX1A104KBQ	C. CAPACITOR CH 10V 0. 1U	1	
C1111	ECUX1H102KBV	C. CAPACITOR CH 50V 1000P	1	
C1112	ECUX1E471KBQ	C. CAPACITOR CH 25V 470P	1	
C1113	ECUX1H151JCQ	C. CAPACITOR CH 50V 150P	1	
C1114	ECUX1H390JCQ	C. CAPACITOR CH 50V 39P	1	
C1117	ECUX1A105KBN	C. CAPACITOR CH 10V 1U	1	
C1118	VCS0JN106	E. CAPACITOR 6. 3V 10M	1	
C1119	ECUX1A105KBN	C. CAPACITOR CH 10V 1U	1	
C1121	ECUX1H472KBV	C. CAPACITOR CH 50V 4700P	1	
C1122	ECUX1C103KBQ	C. CAPACITOR CH 16V 0. 01U	1	
C1123	ECUX1H151JCQ	C. CAPACITOR CH 50V 150P	1	
C1124	ECUX1H390JCQ	C. CAPACITOR CH 50V 39P	1	
C1127-29	ECUX1A105KBN	C. CAPACITOR CH 10V 1U	3	
C1131	ECUX1H822KBV	C. CAPACITOR CH 50V 8200P	1	
C1132	ECUX1A473KBQ	C. CAPACITOR CH 10V 0. 047U	1	
C1133	ECUX1H151JCQ	C. CAPACITOR CH 50V 150P	1	
C1134	ECUX1H390JCQ	C. CAPACITOR CH 50V 39P	1	
C1141, 42	ECUX1A224KBV	C. CAPACITOR CH 10V 0. 22U	2	
C1143	ECUX1H151JCQ	C. CAPACITOR CH 50V 150P	1	
C1144	ECUX1H390JCQ	C. CAPACITOR CH 50V 39P	1	
C1151	ECUX1H471JCV	C. CAPACITOR CH 50V 470P	1	
C1152	ECUX1E222KBQ	C. CAPACITOR CH 25V 2200P	1	
C1153	ECUX1H151JCQ	C. CAPACITOR CH 50V 150P	1	
C1154	ECUX1H820JCQ	C. CAPACITOR CH 50V 82P	1	
C1155	ECUX0J225KBN	C. CAPACITOR CH6. 3V 2. 2U	1	
C1181	ECUX1H822KBV	C. CAPACITOR CH 50V 8200P	1	
C1182	ECUX1C103KBQ	C. CAPACITOR CH 16V 0. 01U	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
C1183	ECUX1H151JCQ	C. CAPACITOR CH 50V 150P	1	
C1184	ECUX1H820JCQ	C. CAPACITOR CH 50V 82P	1	
C1185	ECUX0J225KBN	C. CAPACITOR CH6. 3V 2. 2U	1	
D1051, 52	MA729	DIODE	2	
D1081, 82	MA729	DIODE	2	
D1101	MA8120-L	DIODE	1	
D1103	1SS355	DIODE	1	
D1151	MA8160-M	DIODE	1	
D1152	1SS355	DIODE	1	
FP1001	VJS4273B014	CONNECTOR (FEMALE)	1	
IC1001	BA9734AKV	IC	1	
IC1002	TA75S393F	IC	1	
IC1031	RN5RG30AA	IC	1	
⚠ IP1001	VSF0233F31	IC PROTECTOR	1	
L1001	VLQ0827M3R9	COIL 3. 9UH	1	
L1011	VLQ0827M680	COIL 68UH	1	
L1012	VLQ0810M4R7	COIL 4. 7UH	1	
L1014-16	VLQ0779K100	COIL 10UH	3	
L1017	VLQ0780K100	COIL 10UH	1	
L1021	VLQ0827M150	COIL 15UH	1	
L1022	VLQ0810M4R7	COIL 4. 7UH	1	
L1023	VLQ0779M4R7	COIL 4. 7UH	1	
L1024, 25	VLQ0780K100	COIL 10UH	2	
L1026, 27	VLQ0779K100	COIL 10UH	2	
L1029	VLQ0779K100	COIL 10UH	1	
L1031	VLQ0827M220	COIL 22UH	1	
L1032	VLQ0810M4R7	COIL 4. 7UH	1	
L1041	VLQ0827M220	COIL 22UH	1	
L1042	VLQ0810M4R7	COIL 4. 7UH	1	
L1051	VLQ0779K331	COIL 330UH	1	
L1052	VLQ0780K100	COIL 10UH	1	
L1061	VLQ0827M330	COIL 33UH	1	
L1062	VLQ0827M820	COIL 82UH	1	
L1081	VLQ0779K331	COIL 330UH	1	
L1082	VLQ0780K100	COIL 10UH	1	
PS1001	VJS4029A090	COIL 9UH	1	
Q1011	FP102	TRANSISTOR	1	
Q1021	FP102	TRANSISTOR	1	
Q1022	2SK2151	TRANSISTOR	1	
Q1031	FP102	TRANSISTOR	1	
Q1032	2SB970X	TRANSISTOR	1	
Q1041	FP102	TRANSISTOR	1	
Q1042	2SK2151	TRANSISTOR	1	
Q1051	2SB798	TRANSISTOR	1	
Q1061, 62	FP102	TRANSISTOR	2	
Q1081	2SB798	TRANSISTOR	1	
Q1083	2SD2216	TRANSISTOR	1	
Q1084	XP1401	TRANSISTOR-RESISTOR	1	
Q1101	2SB1462-R	TRANSISTOR	1	
QR1001	MRN2102	TRANSISTOR-RESISTOR	1	
QR1002	UN921F	TRANSISTOR-RESISTOR	1	
QR1004	MRN2111	TRANSISTOR	1	
QR1051	MRN1104	TRANSISTOR	1	
QR1101	MRN1107	TRANSISTOR	1	
R1003	ERJ2GEJ225	M. RESISTOR CH 2W 2. 2M	1	
R1005	ERJ2GEJ103	M. RESISTOR CH 2W 10K	1	
R1006, 07	ERJ8GEY0R00	M. RESISTOR CH 1/8W 0	2	
R1008	ERJ2GEJ473	M. RESISTOR CH 2W 47K	1	
R1009	ERJ8GEY0R00	M. RESISTOR CH 1/8W 0	1	
R1010	ERJ2RKD820	M. RESISTOR CH 2W 82	1	
R1011	ERJ6RBB682	M. RESISTOR CH 1/10W 6. 8K	1	
R1012	ERJ2RKD820	M. RESISTOR CH 2W 82	1	
R1013	ERJ3RBD391	M. RESISTOR CH 3W 390	1	
R1014	ERJ6RBB272	M. RESISTOR CH 1/10W 2. 7K	1	
R1015	ERJ2GEJ331	M. RESISTOR CH 2W 330	1	
R1020	ERJ2RKD820	M. RESISTOR CH 2W 82	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
R1021	ERJ6RBB272	M. RESISTOR CH 1/10W 2. 7K	1	
R1022	ERJ2RKD820	M. RESISTOR CH 2W 82	1	
R1023	ERJ3RBD361	M. RESISTOR CH 3W 360	1	
R1024	ERJ6RBB272	M. RESISTOR CH 1/10W 2. 7K	1	
R1025	ERJ2GEJ331	M. RESISTOR CH 2W 330	1	
R1030	ERJ2RKD820	M. RESISTOR CH 2W 82	1	
R1031	ERJ6RBB562	M. RESISTOR CH 1/10W 5. 6K	1	
R1032	ERJ2RKD820	M. RESISTOR CH 2W 82	1	
R1033	ERJ3RBD511	M. RESISTOR CH 3W 510	1	
R1034	ERJ6RBB272	M. RESISTOR CH 1/10W 2. 7K	1	
R1035	ERJ2GEJ331	M. RESISTOR CH 2W 330	1	
R1036	ERJ2GEJ102	M. RESISTOR CH 2W 1K	1	
R1037	ERJ2GEJ103	M. RESISTOR CH 2W 10K	1	
R1038	ERJ3GEY0R00	M. RESISTOR CH 1/16W 0	1	
R1040	ERJ2RKD820	M. RESISTOR CH 2W 82	1	
R1041	ERJ6RBB152	M. RESISTOR CH 1/10W 1. 5K	1	
R1042	ERJ2RKD820	M. RESISTOR CH 2W 82	1	
R1043	ERJ3RBD511	M. RESISTOR CH 3W 510	1	
R1044	ERJ6RBB272	M. RESISTOR CH 1/10W 2. 7K	1	
R1045	ERJ2GEJ331	M. RESISTOR CH 2W 330	1	
R1050	ERJ2RKD820	M. RESISTOR CH 2W 82	1	
R1051	ERJ6RBB273	M. RESISTOR CH 1/10W 27K	1	
R1052	ERJ2RKD820	M. RESISTOR CH 2W 82	1	
R1053	ERJ3RBD301	M. RESISTOR CH 3W 300	1	
R1054	ERJ6RBB272	M. RESISTOR CH 1/10W 2. 7K	1	
R1056	ERJ2GEJ470	M. RESISTOR CH 2W 47	1	
R1080	ERJ2RKD820	M. RESISTOR CH 2W 82	1	
R1081	ERJ6RBB273	M. RESISTOR CH 1/10W 27K	1	
R1082	ERJ2RKD820	M. RESISTOR CH 2W 82	1	
R1083	ERJ3RBD681	M. RESISTOR CH 3W 680	1	
R1084	ERJ6RBB272	M. RESISTOR CH 1/10W 2. 7K	1	
R1086	ERJ2GEJ470	M. RESISTOR CH 2W 47	1	
R1087	ERJ2RHD223	M. RESISTOR CH 2W 22K	1	
R1088	ERJ2RHD332	M. RESISTOR CH 2W 3. 3K	1	
R1089	ERJ2RHD272	M. RESISTOR CH 2W 2. 7K	1	
R1101	ERJ3RBD223	M. RESISTOR CH 3W 22K	1	
R1102	ERJ6GEYF472	M. RESISTOR CH 1/10W 4. 7K	1	
R1103	ERJ2GEJ472	M. RESISTOR CH 2W 4. 7K	1	
R1104	ERJ2GEJ123	M. RESISTOR CH 2W 12K	1	
R1107	ERJ2GEJ225	M. RESISTOR CH 2W 2. 2M	1	
R1108	ERJ2GEJ473	M. RESISTOR CH 2W 47K	1	
R1109	ERJ2GEJ103	M. RESISTOR CH 2W 10K	1	
R1111	ERJ2GEJ151	M. RESISTOR CH 2W 150	1	
R1112	ERJ2GEJ822	M. RESISTOR CH 2W 8. 2K	1	
R1121	ERJ2GEJ151	M. RESISTOR CH 2W 150	1	
R1122	ERJ2GEJ682	M. RESISTOR CH 2W 6. 8K	1	
R1131	ERJ2GEJ151	M. RESISTOR CH 2W 150	1	
R1132	ERJ2GEJ682	M. RESISTOR CH 2W 6. 8K	1	
R1141	ERJ2GEJ151	M. RESISTOR CH 2W 150	1	
R1142	ERJ2GEJ103	M. RESISTOR CH 2W 10K	1	
R1151	ERJ2GEJ151	M. RESISTOR CH 2W 150	1	
R1152	ERJ2GEJ822	M. RESISTOR CH 2W 8. 2K	1	
R1153	ERJ2RHD123	M. RESISTOR CH 2W 12K	1	
R1154	ERJ2RHD473	M. RESISTOR CH 2W 47K	1	
R1155	ERJ2GEJ103	M. RESISTOR CH 2W 10K	1	
R1158	ERJ2GE0R00	M. RESISTOR CH 2W 0	1	
R1159	ERJ2GEJ472	M. RESISTOR CH 2W 4. 7K	1	
R1181	ERJ2GEJ151	M. RESISTOR CH 2W 150	1	
R1182	ERJ2GEJ822	M. RESISTOR CH 2W 8. 2K	1	
R1183	ERJ2RHD123	M. RESISTOR CH 2W 12K	1	
R1184	ERJ2RHD473	M. RESISTOR CH 2W 47K	1	
R1186	ERJ2GEJ332	M. RESISTOR CH 2W 3. 3K	1	
R1187	ERJ2GEJ272	M. RESISTOR CH 2W 2. 7K	1	
T1051	VTP0525	TRANSFORMER	1	
T1081	VTP0518	TRANSFORMER	1	
		MISCELLANEOUS		
	VMZ2833	POWER SHIELD BARRIER	1	
	VGQ5300	BARRIER	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
■	VEP02563A	DRIVE C. B. A.	1	(RTL)
C2202	ECUX1A105KBN	C. CAPACITOR CH 10V 1U	1	
C2203	ECUX1E332KBQ	C. CAPACITOR CH 25V 3300P	1	
C2205	ECUX1A105KBN	C. CAPACITOR CH 10V 1U	1	
C2206	ECUX1E332KBQ	C. CAPACITOR CH 25V 3300P	1	
C2207	ECUX1H221JCQ	C. CAPACITOR CH 50V 220P	1	
C2208, 09	ECUX1C103KBQ	C. CAPACITOR CH 16V 0.01U	2	
C2210	ECUX1A105KBN	C. CAPACITOR CH 10V 1U	1	
C2212	ECST0JY106Z	T. CAPACITOR CH6.3V 10U	1	
C2213, 14	ECUX1C103KBQ	C. CAPACITOR CH 16V 0.01U	2	
C2216	ECST0JY106Z	T. CAPACITOR CH6.3V 10U	1	
C2217	ECUX1A105KBN	C. CAPACITOR CH 10V 1U	1	
C2218	ECUX1H470JCQ	C. CAPACITOR CH 50V 47P	1	
C2219	ECUX1A105KBN	C. CAPACITOR CH 10V 1U	1	
C2220	ECUX1E102KBQ	C. CAPACITOR CH 25V 1000P	1	
C2221	ECUX1A105KBN	C. CAPACITOR CH 10V 1U	1	
C2222-26	ECUX1A104KBQ	C. CAPACITOR CH 10V 0.1U	5	
C2227	ECST0JY106Z	T. CAPACITOR CH6.3V 10U	1	
C2233	ECUX1A104KBQ	C. CAPACITOR CH 10V 0.1U	1	
FP2201	VJS4273B018	CONNECTOR (FEMALE)	1	
FP2202	VJS4274B010	CONNECTOR (FEMALE)	1	
FP2203	VJS3320B018	CONNECTOR (FEMALE)	1	
FP6304	VJS4036B008	CONNECTOR (FEMALE)	1	
IC2201	TB6534F	IC	1	
IC2202, 03	UN224	TRANSISTOR-RESISTOR	2	
PP2001	VJP4099C070	COIL 9UH	1	
PS3801	VJS4100	CONNECTOR (FEMALE)	1	
R2201	ERJ2GEJ224	M. RESISTOR CH 2W 220K	1	
R2202	ERJ2GEJ102	M. RESISTOR CH 2W 1K	1	
R2203	ERJ2GEJ224	M. RESISTOR CH 2W 220K	1	
R2204	ERJ2GEJ102	M. RESISTOR CH 2W 1K	1	
R2205	ERJ8RQJR27	M. RESISTOR CH 1/8W 0.27	1	
R2206	ERJ2GEJ222	M. RESISTOR CH 2W 2.2K	1	
R2207	ERJ2GEJ122	M. RESISTOR CH 2W 1.2K	1	
R2208	ERJ2GEJ273	M. RESISTOR CH 2W 27K	1	
R2209	ERJ2GEJ753	M. RESISTOR CH 2W 75K	1	
R2210	ERJ2GEJ102	M. RESISTOR CH 2W 1K	1	
R2211	ERJ2GEJ473	M. RESISTOR CH 2W 47K	1	
R2212	ERJ2GEJ102	M. RESISTOR CH 2W 1K	1	
R2213	ERJ2GEJ101	M. RESISTOR CH 2W 100	1	
R2214	ERJ2GE0R00	M. RESISTOR CH 2W 0	1	
R2215	ERJ2GEJ683	M. RESISTOR CH 2W 68K	1	
R2216	ERJ8GEYJR33	M. RESISTOR CH 1/8W 0.33	1	
R2217	ERJ2GEJ333	M. RESISTOR CH 2W 33K	1	
R2218	ERJ2GEJ103	M. RESISTOR CH 2W 10K	1	
R6801	ERJ2GEJ181	M. RESISTOR CH 2W 180	1	
		MISCELLANEOUS		
	VMP5681	28P HOLDER ANGLE	1	
	VGQ5024	28P BARRIER	1	
■	VEP23479A	OP IF C. B. A.	1	(RTL)
FP6302	VJS4010B010	CONNECTOR (FEMALE)	1	
FP6702	VJS4011B006	CONNECTOR (FEMALE)	1	
PP3401	VJP4028C070	CONNECTOR (MALE)	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
■	VEP00262A	C. D DET. FLEX CARD C. B. A.	1	(RTL)
S6501, 02	VSP0584	SWITCH	2	
■	VEP04736A	MIC UNIT C. B. A.	1	(RTL)
■	VEP04713A	ECM FPC C. B. A.	1	(RTL) FOR VEP04736A
C4001	ECUX1A104KBQ	C. CAPACITOR CH 10V 0.1U	1	
C4002	VCS0JN106	E. CAPACITOR 6.3V 10M	1	
C4003, 04	ECUX0J335VBN	C. CAPACITOR CH6.3V 3.3U	2	
C4005, 06	ECUX1E152KBQ	C. CAPACITOR CH 25V 1500P	2	
C4007	ECST0JX226Z	T. CAPACITOR CH6.3V 22U	1	
C4011	ECUX1C104ZFQ	C. CAPACITOR CH 16V 0.1U	1	
C4012	VCS0JJ106	T. CAPACITOR 6.3V 10U	1	
C4013, 14	ECUX1H121JCQ	C. CAPACITOR CH 50V 120P	2	
C4015, 16	ECUX0J335VBN	C. CAPACITOR CH6.3V 3.3U	2	
C4201, 02	ECUX1C333KBQ	C. CAPACITOR CH 16V 0.033U	2	
C4203	VCS0JJ106	T. CAPACITOR 6.3V 10U	1	
C4204	ECUX1C103KBQ	C. CAPACITOR CH 16V 0.01U	1	
C4205	ECUX1E222KBQ	C. CAPACITOR CH 25V 2200P	1	
C4206	ECUX1C103KBQ	C. CAPACITOR CH 16V 0.01U	1	
C4207	ECUX1C104ZFQ	C. CAPACITOR CH 16V 0.1U	1	
C4208	ECUX1E122KBQ	C. CAPACITOR CH 25V 1200P	1	
C4209, 10	ECUX0J474KBV	C. CAPACITOR CH6.3V 0.47U	2	
C4211	ECUX1E122KBQ	C. CAPACITOR CH 25V 1200P	1	
C4212, 13	ECST0JX476Z	T. CAPACITOR CH6.3V 47U	2	
C4214, 15	ECUX1A104KBQ	C. CAPACITOR CH 10V 0.1U	2	
C4218	VCS0JJ106	T. CAPACITOR 6.3V 10U	1	
C4219	ECUX1C104ZFQ	C. CAPACITOR CH 16V 0.1U	1	
C4702	VCS0JN106	E. CAPACITOR 6.3V 10M	1	
C4703-05	ECUX1C153KBQ	C. CAPACITOR CH 16V 0.015U	3	
C4801	ECUX1E273KBV	C. CAPACITOR CH 25V 0.027U	1	
C4802, 03	ECUX1C473KBV	C. CAPACITOR CH 16V 0.047U	2	
C4805	ECUX1C154KBN	C. CAPACITOR CH 16V 0.15U	1	
C4806	ECUX1E273KBV	C. CAPACITOR CH 25V 0.027U	1	
C4807	ECUX1C473KBV	C. CAPACITOR CH 16V 0.047U	1	
C4809	ECUX1C154KBN	C. CAPACITOR CH 16V 0.15U	1	
C4810	ECUX1C473KBV	C. CAPACITOR CH 16V 0.047U	1	
C4811	ECST0JX226Z	T. CAPACITOR CH6.3V 22U	1	
C4812, 13	ECUX1H103KBV	C. CAPACITOR CH 50V 0.01U	2	
C4814	ECUX1C104KBV	C. CAPACITOR CH 16V 0.1U	1	
C4815	ECUX1H153KBV	C. CAPACITOR CH 50V 0.015U	1	
C4816	ECUX1C104KBV	C. CAPACITOR CH 16V 0.1U	1	
C4817	ECUX1H153KBV	C. CAPACITOR CH 50V 0.015U	1	
C4818	ECST0JX226Z	T. CAPACITOR CH6.3V 22U	1	
C4819, 20	ECUX1H182KBV	C. CAPACITOR CH 50V 1800P	2	
D4001	MA133	DIODE	1	
D4002	MA728	DIODE	1	
FP4001	VJS3971B039	CONNECTOR (FEMALE)	1	
FP4801	VJS3319B005	CONNECTOR (FEMALE)	1	
IC4001	NJM3414AVT	IC	1	
IC4201	BA7785FS	IC	1	
IC4701	M9831-103MSK	IC	1	
IC4801	NJM2112V	IC	1	
IC4802	NJM2115VAT	IC	1	
L4001	VLQ0807K100	COIL 10UH	1	
L4201	VLQ0807K100	COIL 10UH	1	
L4202	VLQ0464K100	COIL 10UH	1	
M4801, 02	WM-61A102A	ECM	2	
Q4001	XN4504	TRANSISTOR-RESISTOR	1	
Q4701	2SD1979-S	TRANSISTOR	1	
Q4702	XP4401	TRANSISTOR-RESISTOR	1	
Q4810-16	2SD2216	TRANSISTOR	7	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
QR4001	MRN1103	TRANSISTOR	1	
QR4002	MRN2103	TRANSISTOR	1	
QR4201, 02	MRN1104	TRANSISTOR	2	
QR4203	MRN1103	TRANSISTOR	1	
QR4801, 02	MRN1103	TRANSISTOR	2	
R4001, 02	ERJ2RHD273	M. RESISTOR CH 2W 27K	2	
R4003, 04	ERJ2RHD822	M. RESISTOR CH 2W 8.2K	2	
R4011, 12	ERJ2RHD103	M. RESISTOR CH 2W 10K	2	
R4013, 14	ERJ2RHD223	M. RESISTOR CH 2W 22K	2	
R4015, 16	ERJ2GEJ273	M. RESISTOR CH 2W 27K	2	
R4017, 18	ERJ2GEJ331	M. RESISTOR CH 2W 330	2	
R4021	ERJ2GEJ124	M. RESISTOR CH 2W 120K	1	
R4022	ERJ2GEJ681	M. RESISTOR CH 2W 680	1	
R4201, 02	ERJ2GEJ682	M. RESISTOR CH 2W 6.8K	2	
R4203, 04	ERJ2GEJ103	M. RESISTOR CH 2W 10K	2	
R4211	ERJ2GEJ473	M. RESISTOR CH 2W 47K	1	
R4223	ERJ2GEJ473	M. RESISTOR CH 2W 47K	1	
R4702	ERJ2GEJ102	M. RESISTOR CH 2W 1K	1	
R4703	ERJ2GEJ154	M. RESISTOR CH 2W 150K	1	
R4704	ERJ2GEJ392	M. RESISTOR CH 2W 3.9K	1	
R4706, 07	ERJ2GEJ822	M. RESISTOR CH 2W 8.2K	2	
R4708, 09	ERJ2GEJ392	M. RESISTOR CH 2W 3.9K	2	
R4710, 11	ERJ2GEJ102	M. RESISTOR CH 2W 1K	2	
R4801	ERJ6GEYG392	M. RESISTOR CH 1/10W 3.9K	1	
R4803	ERJ6GEYG392	M. RESISTOR CH 1/10W 3.9K	1	
R4805	ERJ2GEJ333	M. RESISTOR CH 2W 33K	1	
R4806	ERJ2GEJ823	M. RESISTOR CH 2W 82K	1	
R4807	ERJ2GEJ223	M. RESISTOR CH 2W 22K	1	
R4808	ERJ2GEJ104	M. RESISTOR CH 2W 100K	1	
R4809, 10	ERJ2GEJ103	M. RESISTOR CH 2W 10K	2	
R4811	ERJ2GEJ333	M. RESISTOR CH 2W 33K	1	
R4812	ERJ2GEJ823	M. RESISTOR CH 2W 82K	1	
R4813	ERJ2GEJ223	M. RESISTOR CH 2W 22K	1	
R4814	ERJ2GEJ104	M. RESISTOR CH 2W 100K	1	
R4815, 16	ERJ2GEJ103	M. RESISTOR CH 2W 10K	2	
R4817, 18	ERJ2GEJ393	M. RESISTOR CH 2W 39K	2	
R4823	ERJ2GEJ223	M. RESISTOR CH 2W 22K	1	
R4824	ERJ2GEJ333	M. RESISTOR CH 2W 33K	1	
R4831, 32	ERJ2GEJ472	M. RESISTOR CH 2W 4.7K	2	
R4833	ERJ2GEJ153	M. RESISTOR CH 2W 15K	1	
R4834	ERJ2GEJ222	M. RESISTOR CH 2W 2.2K	1	
R4835	ERJ2GEJ333	M. RESISTOR CH 2W 33K	1	
R4836	ERJ2GEJ104	M. RESISTOR CH 2W 100K	1	
R4837	ERJ2GEJ332	M. RESISTOR CH 2W 3.3K	1	
R4838	ERJ2GEJ153	M. RESISTOR CH 2W 15K	1	
R4839	ERJ2GEJ222	M. RESISTOR CH 2W 2.2K	1	
R4840	ERJ2GEJ333	M. RESISTOR CH 2W 33K	1	
R4841	ERJ2GEJ104	M. RESISTOR CH 2W 100K	1	
R4842	ERJ2GEJ332	M. RESISTOR CH 2W 3.3K	1	
R4843	ERJ2GEJ472	M. RESISTOR CH 2W 4.7K	1	
R4844-49	ERJ2GEJ153	M. RESISTOR CH 2W 15K	6	
R4850	ERJ2GEJ103	M. RESISTOR CH 2W 10K	1	
R4851	ERJ2GEJ332	M. RESISTOR CH 2W 3.3K	1	
R4852	ERJ2GEJ103	M. RESISTOR CH 2W 10K	1	
R4853	ERJ2GEJ332	M. RESISTOR CH 2W 3.3K	1	
R4860	ERJ2GEJ104	M. RESISTOR CH 2W 100K	1	
R4863	ERJ2GEJ104	M. RESISTOR CH 2W 100K	1	
R4999	VEK8428	DEW SENSOR ASS'Y	1	
RA4001	EXB24V562J	COMBI. R-R 5.6K	1	
X4701	VSX0982	CRYSTAL OSCILLATOR	1	
		MISCELLANEOUS		
	VMT0902	MIC DUMPER	1	
	VMP5673	DEW HOLER ANGLE	1	
	XQN2+B2	SCREW	1	
	XQN16+B2FZ	SCREW	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
■	VEP28254B	E.V.F. (A) C.B.A.	1	(RTL)
C801	ECUX1A335KBM	C. CAPACITOR CH 10V 3.3P	1	
C802	ECUX1C104KBV	C. CAPACITOR CH 16V 0.1U	1	
C803	ECST0JY106Z	T. CAPACITOR CH6.3V 10U	1	
C804, 05	ECUX1C104KBV	C. CAPACITOR CH 16V 0.1U	2	
C806	ECST0JY106Z	T. CAPACITOR CH6.3V 10U	1	
C807-09	ECUX1C104KBV	C. CAPACITOR CH 16V 0.1U	3	
C810	ECUX1H102KBV	C. CAPACITOR CH 50V 1000P	1	
C811	ECUX1H472KBV	C. CAPACITOR CH 50V 4700P	1	
C812	ECST1CY225Z	T. CAPACITOR CH 16V 2.2U	1	
C814	ECUX1H470JCV	C. CAPACITOR CH 50V 47P	1	
C820, 21	ECUX1C104KBV	C. CAPACITOR CH 16V 0.1U	2	
D801	MA338	DIODE	1	
D803	1SS355	DIODE	1	
FP804	VJS4036B016	CONNECTOR (FEMALE)	1	
IC801	ET2070F0C	IC	1	
IC802	TA75S558F	IC	1	
IC803	PQ20VZ1U	IC	1	
L801	VLQ0426J6R8	COIL 6.8UH	1	
L803-05	VLQ0807K100	COIL 10UH	3	
L820	VLQ0779K100	COIL 10UH	1	
R802	ERJ3GEYG102	M. RESISTOR CH 1/16W 1K	1	
R805	ERJ3GEYG102	M. RESISTOR CH 1/16W 1K	1	
R807, 08	ERJ3GEYG102	M. RESISTOR CH 1/16W 1K	2	
R810	ERJ3GEYJ104	M. RESISTOR CH 1/16W 100K	1	
R812	ERJ3GEYG102	M. RESISTOR CH 1/16W 1K	1	
R813	ERJ3GEYG472	M. RESISTOR CH 1/16W 4.7K	1	
R814, 15	ERJ3GEYG471	M. RESISTOR CH 1/16W 470	2	
R816	ERJ3GEYJ223	M. RESISTOR CH 1/16W 22K	1	
R817	ERJ3GEYJ103	M. RESISTOR CH 1/16W 10K	1	
R818	ERJ3GEYG682	M. RESISTOR CH 1/16W 6.8K	1	
R820	ERJ3GEYJ101	M. RESISTOR CH 1/16W 100	1	
R821	ERJ3GEYJ473	M. RESISTOR CH 1/16W 47K	1	
R822	ERJ3RBD183	M. RESISTOR CH 3W 18K	1	
R823	ERJ3RBD272	M. RESISTOR CH 3W 2.7K	1	
R824	ERJ3RBD183	M. RESISTOR CH 3W 18K	1	
R825	ERJ3GEYG102	M. RESISTOR CH 1/16W 1K	1	
R826	ERJ3RBD102	M. RESISTOR CH 3W 1K	1	
R827	ERJ3RBD112	M. RESISTOR CH 3W 1.1K	1	
R828	ERJ3RBD272	M. RESISTOR CH 3W 2.7K	1	
W802, 03	ERJ3GEY0R00	M. RESISTOR CH 1/16W 0	2	
W805, 06	ERJ3GEY0R00	M. RESISTOR CH 1/16W 0	2	
■	VEP28255A	E.V.F. (B) C.B.A.	1	(RTL)
BL820	VLL0210	LAMP	1	
C822	ECUX1A226MBS	C. CAPACITOR CH 10V 22U	1	
Q820	2SK2055	TRANSISTOR	1	
T820	ETJ11K73AM	TRANSFORMER	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
■	VEP00Z58A	AV JACK C. B. A.	1	(RTL)
C4051, 52	ECUM1H472KBN	C. CAPACITOR CH 50V 4700P	2	
FL4051	VLF1445	FILTER	1	
FL4052	VLF1341B107	FILTER	1	
J4051	VJJ0612	AV JACK	1	
		MISCELLANEOUS		
	VGQ5120	TAPE	1	
	VMZ2897	BARRIER	1	
■	VEP06C60A	HALL SENSOR FLEX. CARD C. B. A	1	(RTL)
IC991, 92	DN8797MSC	IC	2	
■	VEP26204B	MONITOR C. B. A.	1	(RTL)
C901	ECUX1A105KBN	C. CAPACITOR CH 10V 1U	1	
C902	ECUX1C105KBM	C. CAPACITOR CH 16V 1U	1	
C903	ECUX1E471KBQ	C. CAPACITOR CH 25V 470P	1	
C904	ECUX1H150JCQ	C. CAPACITOR CH 50V 15P	1	
C905	ECUX1C104KBV	C. CAPACITOR CH 16V 0. 1U	1	
C906	ECUX1E561KBQ	C. CAPACITOR CH 25V 560P	1	
C907, 08	ECUX1C104KBV	C. CAPACITOR CH 16V 0. 1U	2	
C909	ECST0JY106Z	T. CAPACITOR CH6. 3V 10U	1	
C910	ECUX1C105KBM	C. CAPACITOR CH 16V 1U	1	
C911	ECUX1E222KBQ	C. CAPACITOR CH 25V 2200P	1	
C912	ECST0JY106Z	T. CAPACITOR CH6. 3V 10U	1	
C913	ECUX1C105KBM	C. CAPACITOR CH 16V 1U	1	
C914	ECUX1E102KBQ	C. CAPACITOR CH 25V 1000P	1	
C915	ECUX0J106VBM	C. CAPACITOR CH6. 3V 10U	1	
C916	ECST0JY106Z	T. CAPACITOR CH6. 3V 10U	1	
C917	ECUX1A105KBN	C. CAPACITOR CH 10V 1U	1	
C918	ECST1VX225Z	T. CAPACITOR CH 35V 2. 2U	1	
C919	ECUX1A334KBV	C. CAPACITOR CH 10V 0. 33U	1	
C920	ECST1AY475	T. CAPACITOR CH 10V 4. 7U	1	
C922-27	ECUX1C104KBV	C. CAPACITOR CH 16V 0. 1U	6	
C928	ECST0JY106Z	T. CAPACITOR CH6. 3V 10U	1	
C930-33	ECUX1E471KBQ	C. CAPACITOR CH 25V 470P	4	
D901	MA329	DIODE	1	
D902	MA111	DIODE	1	
FP901	VJS4194B026	CONNECTOR (FEMALE)	1	
FP902	VJS3319B008	CONNECTOR (FEMALE)	1	
FP903, 04	VJS3971B021	CONNECTOR (FEMALE)	2	
FP905	VJS3319B006	CONNECTOR (FEMALE)	1	
IC901	CM7018L3	IC	1	
IC902, 03	TA75S558F	IC	2	
IC904	TC7S14F	IC	1	
IC905	TC7S04FU	IC	1	
IC906, 07	TA75S558F	IC	2	
L901	VLQ0807K220	COIL 22UH	1	
L902	VLQ0426J100	COIL 10UH	1	
L903-10	VLQ0807K100	COIL 10UH	8	
Q901-04	2SD2216	TRANSISTOR	4	
Q905, 06	XP4601	TRANSISTOR-RESISTOR	2	
QR901	XP4314	TRANSISTOR-RESISTOR	1	
QR902	MRN1104	TRANSISTOR	1	

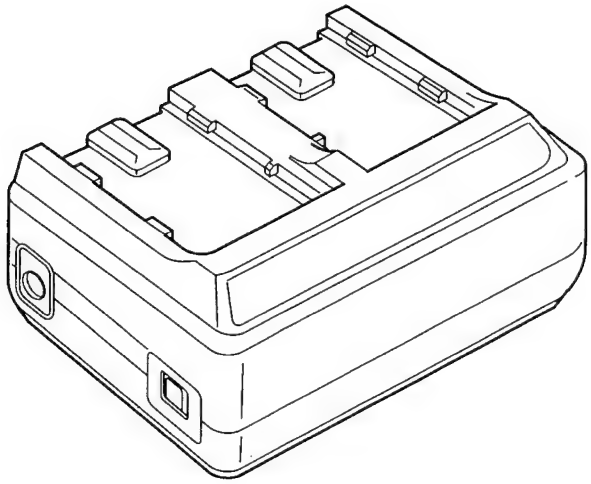
Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
R901	ERJ3GEYJ103	M. RESISTOR CH 1/16W 10K	1	
R902	ERJ3GEYJ105	M. RESISTOR CH 1/16W 1M	1	
R903	ERJ3GEYJ683	M. RESISTOR CH 1/16W 68K	1	
R904	ERJ2GEJ223	M. RESISTOR CH 2W 22K	1	
R905	ERJ3GEYJ683	M. RESISTOR CH 1/16W 68K	1	
R906	ERJ2GEJ472	M. RESISTOR CH 2W 4. 7K	1	
R907	ERJ2GEJ473	M. RESISTOR CH 2W 47K	1	
R908	ERJ3GEYJ124	M. RESISTOR CH 1/16W 120K	1	
R909	ERJ2GEJ333	M. RESISTOR CH 2W 33K	1	
R910	ERJ2GEJ104	M. RESISTOR CH 2W 100K	1	
R911	ERJ2GEJ472	M. RESISTOR CH 2W 4. 7K	1	
R912	ERJ2GEJ471	M. RESISTOR CH 2W 470	1	
R916	ERJ3RBD182	M. RESISTOR CH 3W 1. 8K	1	
R917	ERJ3GEY0R00	M. RESISTOR CH 1/16W 0	1	
R918	ERJ3GEYG682	M. RESISTOR CH 1/16W 6. 8K	1	
R919-21	ERJ2GEJ101	M. RESISTOR CH 2W 100	3	
R922, 23	ERJ2GEJ563	M. RESISTOR CH 2W 56K	2	
R924	ERJ3GEYJ333	M. RESISTOR CH 1/16W 33K	1	
R925	ERJ2GE0R00	M. RESISTOR CH 2W 0	1	
R926	ERJ2GEJ563	M. RESISTOR CH 2W 56K	1	
R927	ERJ2GE0R00	M. RESISTOR CH 2W 0	1	
R928	ERJ2GEJ333	M. RESISTOR CH 2W 33K	1	
R930	ERJ2GEJ333	M. RESISTOR CH 2W 33K	1	
R931	ERJ2GEJ682	M. RESISTOR CH 2W 6. 8K	1	
R932	ERJ2GEJ223	M. RESISTOR CH 2W 22K	1	
R933	ERJ2GEJ103	M. RESISTOR CH 2W 10K	1	
R934	ERJ2GEJ473	M. RESISTOR CH 2W 47K	1	
R935	ERJ2GEJ103	M. RESISTOR CH 2W 10K	1	
R936	ERJ2GEJ104	M. RESISTOR CH 2W 100K	1	
R937	ERJ3GEYJ103	M. RESISTOR CH 1/16W 10K	1	
R938	ERJ2GEJ682	M. RESISTOR CH 2W 6. 8K	1	
R939	ERJ2GEJ103	M. RESISTOR CH 2W 10K	1	
R940	ERJ3GEYJ103	M. RESISTOR CH 1/16W 10K	1	
R941	ERJ3GEYJ220	M. RESISTOR CH 1/16W 22	1	
R942	ERJ2GEJ104	M. RESISTOR CH 2W 100K	1	
R955	ERJ2GEJ563	M. RESISTOR CH 2W 56K	1	
R959	ERJ2RHD104	M. RESISTOR CH 2W 100K	1	
R960, 61	ERJ2GEJ223	M. RESISTOR CH 2W 22K	2	
W902	ERJ2GE0R00	M. RESISTOR CH 2W 0	1	
■	VEP00Z59A	IR C. B. A.	1	(RTL)
C6401	ECUX1E104KBN	C. CAPACITOR CH 25V 0. 1U	1	
C6402	ECST0JY106Z	T. CAPACITOR CH6. 3V 10U	1	
D6801	CL150HR-CD	DIODE	1	
D6802	PH310	DIODE	1	
IR6401	VEK8283	REMOTE CONTROL RECEIVER	1	
■	VEP22279A	CCD FLEX. CARD C. B. A.	1	(RTL)
C294	ECST1VX225Z	T. CAPACITOR CH 35V 2. 2U	1	
C295	ECUM1E104ZFN	C. CAPACITOR CH 25V 0. 1U	1	
D291	VJP4009C020	CONNECTOR (MALE) 20P	1	
Q291	2SC3930	TRANSISTOR	1	
R292	ERJ6GEYF472	M. RESISTOR CH 1/10W 4. 7K	1	
		MISCELLANEOUS		
	VJB22279	FLEX. CARD	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
■	VEK8456	LENS FLEX. CARD C. B. A.	1	(RTL)
		MISCELLANEOUS		
	CNA1312K01VT	PHOTO SENSOR	1	
	VEK8449	MR SENSOR ASS'Y	1	
	VJB20763	FLEX. CARD	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks

SECTION 5

VW – AD7E



SPECIFICATIONS

ITEM	SPECIFICATION
POWER	Source: AC 100 ~ 240 V, 50/60 Hz (Automatic Voltage Adjustment)
	Consumption: Approx. 20 W
	Output: DC 7.9 V, 9 W (Movie Camera Operation) DC 8.4 V, 1.2 A (Battery Pack Charging) Input: DC 12 V (Car Battery)
DIMENSIONS	102 (W)×50 (H)×79 (D) mm
WEIGHT	Approx. 230 g (Without AC Cable)

Weight and dimensions shown are approximate.
Specifications are subject to change without notice.,

CAUTION: FOR USE WITH DIGITAL VIDEO CAMERA, MODEL NV-DS77, NV-DA1, NV-EX1 Series.
WARNING: TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE.

⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

CONTENTS

INTRODUCTION

Caution for AC CORD (VJA0940 type)

Information for Your Safety

IMPORTANT

Your attention is drawn to the fact that recording of pre-recorded tapes or discs or other published or broadcast material may infringe copyright laws.

WARNING

To reduce the risk of fire or shock hazard, do not expose this equipment to rain or moisture.

CAUTION

To reduce the risk of fire or shock hazard and annoying interference, use the recommended accessories only.

FOR YOUR SAFETY

■DO NOT REMOVE THE OUTER COVER.

To prevent electric shock, do not remove the cover. No user serviceable parts inside. Refer servicing to qualified service personnel.

Caution for AC Mains Lead

For your safety, please read the following text carefully.

This appliance is supplied with a moulded three-pin mains plug for your safety and convenience.
A 5-ampere fuse is fitted in this plug.
Should the fuse need to be replaced please ensure that the replacement fuse has a rating of 5 amperes and it is approved by ASTA or BSI to BS1362.
Check for the ASTA mark ⓐ or the BSI mark ♡ on the body of the fuse.

If the plug contains a removable fuse cover you must ensure that it is refitted when the fuse is replaced.
If you lose the fuse cover, the plug must not be used until a replacement cover is obtained.
A replacement fuse cover can be purchased from your local Panasonic Dealer.

If the fitted moulded plug is unsuitable for the socket outlet in your home then the fuse should be removed and the plug cut off and disposed of safety.
There is a danger of severe electrical shock if the cut off plug is inserted into any 13-ampere socket.

If a new plug is to be fitted please observe the wiring code as shown below.
If in any doubt, please consult a qualified electrician.

■IMPORTANT

The wires in this mains lead are coloured in accordance with the following code:

Blue: Neutral
Brown: Live

As the colours of the wires in the mains lead of this appliance may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:

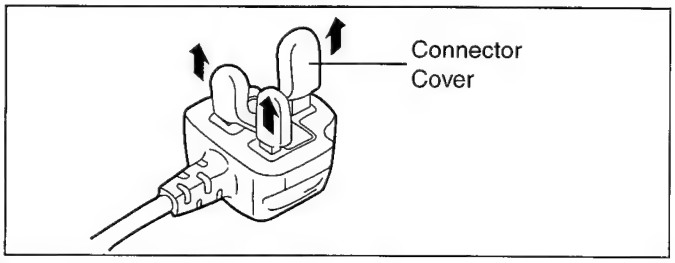
the wire which is coloured BLUE must be connected to the terminal in the plug which is marked with the letter N or coloured BLACK.

The wire which is coloured BROWN must be connected to the terminal in the plug which is marked with the letter L or coloured RED.

Under no circumstances should either of these wires be connected to the earth terminal of the three pin plug, marked with the letter E or the Earth Symbol ⏚.

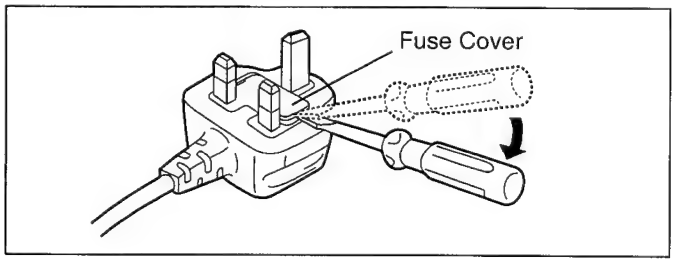
■Before use

remove the Connector Cover as follows.

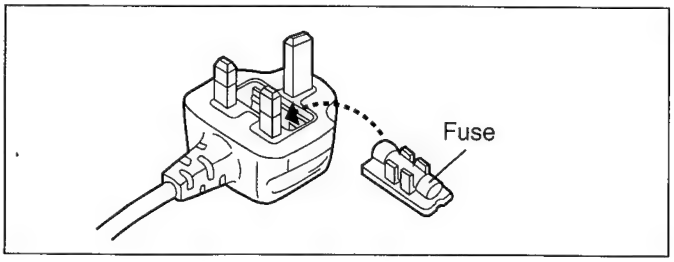


■How to replace the Fuse

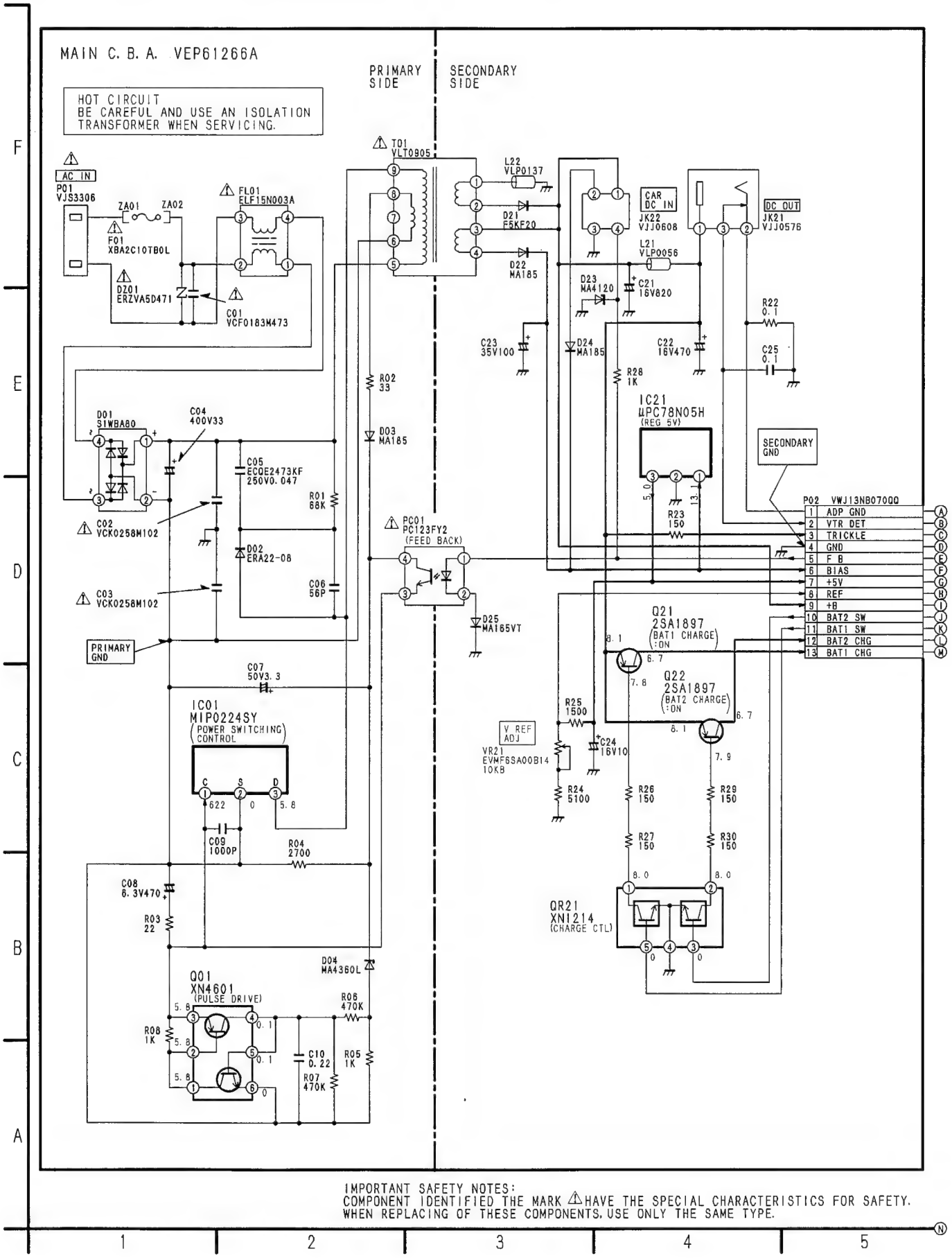
1. Remove the Fuse Cover with a screwdriver.



2. Replace the fuse and attach the Fuse cover.

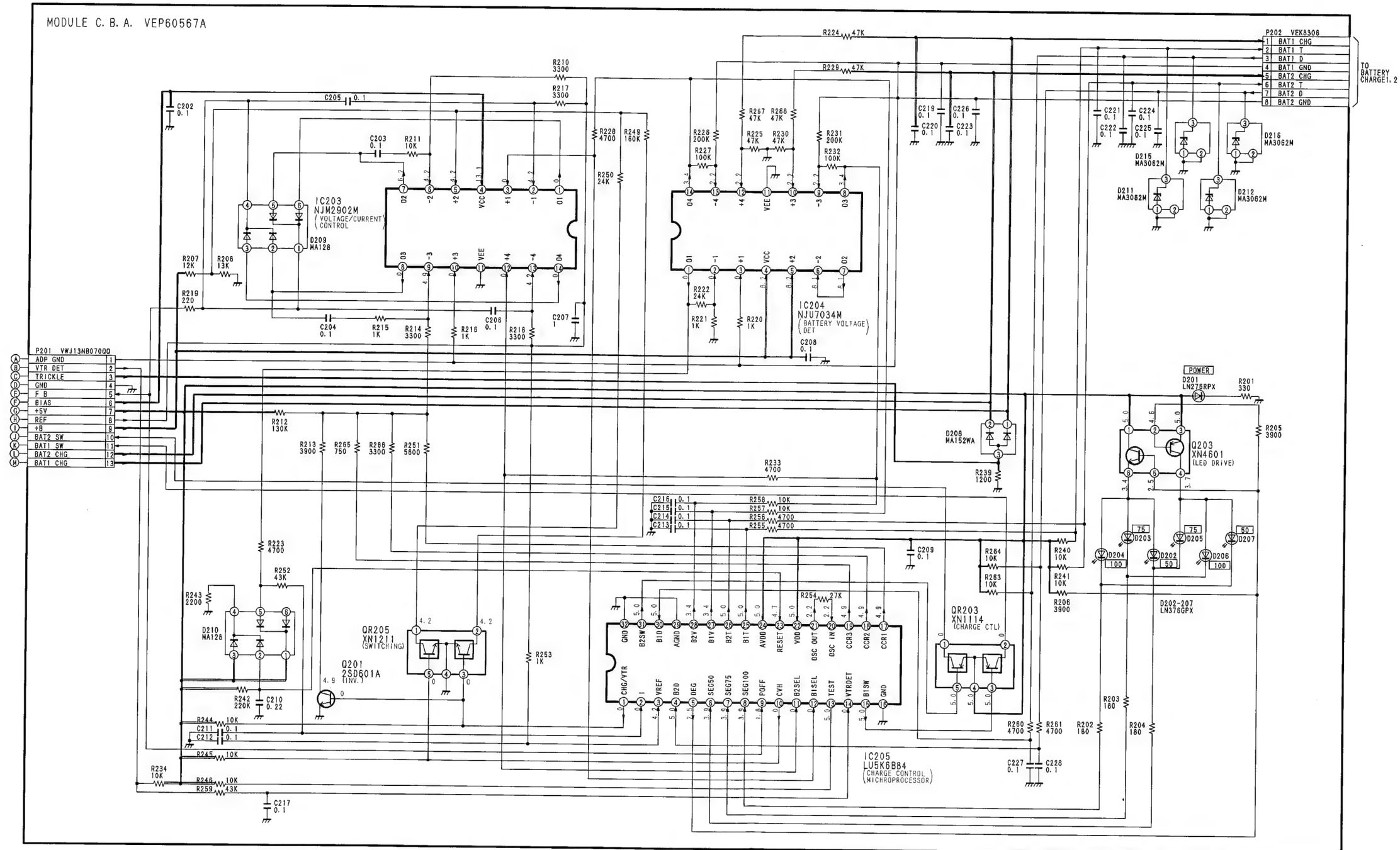


1. AC ADAPTOR SCHEMATIC DIAGRAM



IMPORTANT SAFETY NOTES:
COMPONENT IDENTIFIED THE MARK ⚠ HAVE THE SPECIAL CHARACTERISTICS FOR SAFETY.
WHEN REPLACING OF THESE COMPONENTS, USE ONLY THE SAME TYPE.

MODULE C. B. A. VEP60567A



NOTE1: DO NOT USE ANY PART NUMBER SHOWN ON THIS SCHEMATIC DIAGRAM FOR ORDERING. WHEN YOU ORDER A PART, PLEASE REFER TO PARTS LIST.

NOTE2: WHEN MEASURE THE DC VOLTAGE AND WAVEFORM, CONNECT THE GND READ OR GND PROBE TO NEXT GND.
PRIMARY SIDE..... IC01-2 PIN OF THE MAIN C. B. A. (PRIMARY GND).
SECONDARY SIDE.... P02-4 PIN OF THE MAIN C. B. A. (SECONDARY GND).

NOTE3: THE DC VOLTAGE INDICATED IN PRIMARY SIDE IS MEASURE WHEN INPUT AC 220V IS SAPPLIED.

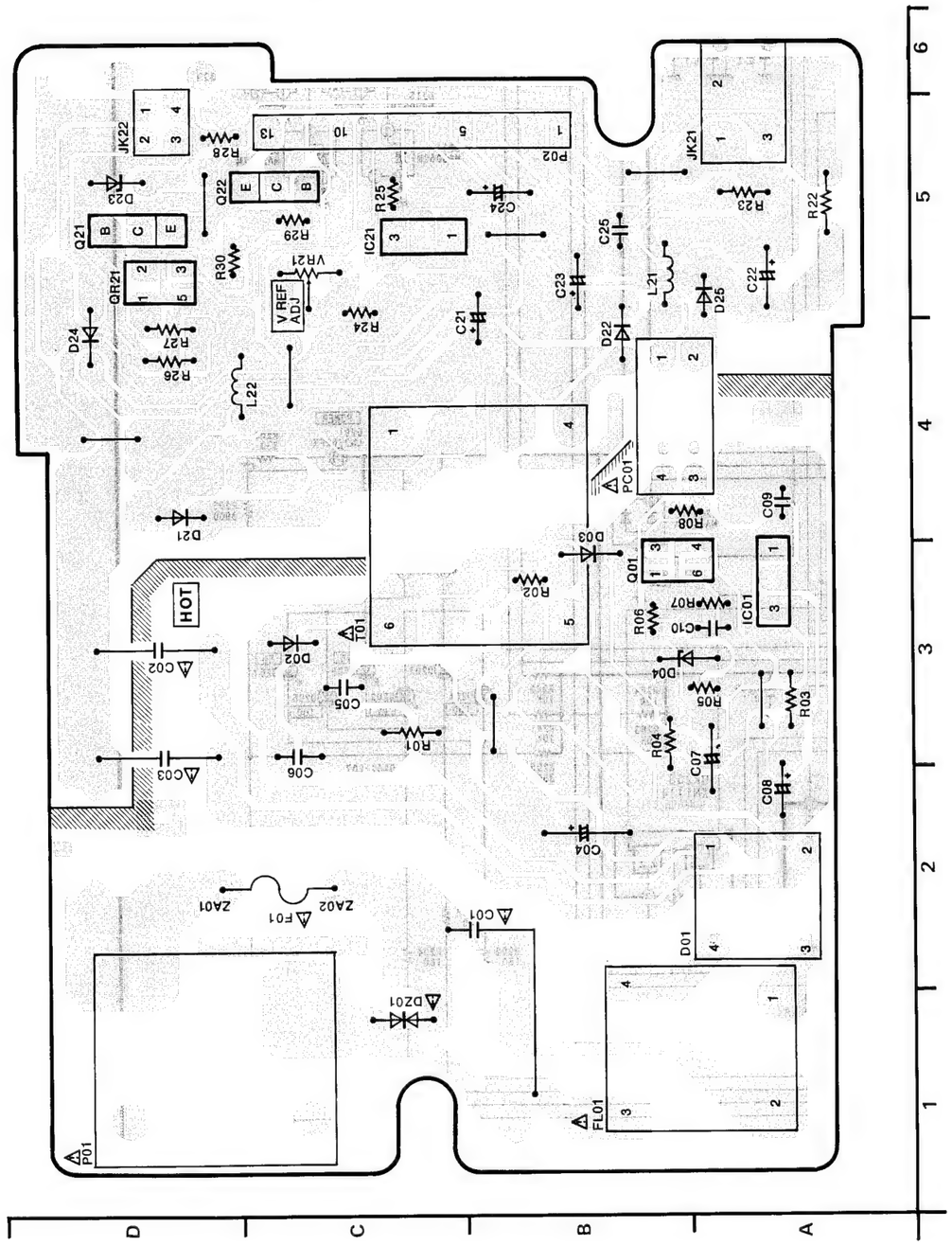
6 7 8 9 10 11 12 13 14 15

2. AC ADAPTOR CIRCUIT BOARD DIAGRAM

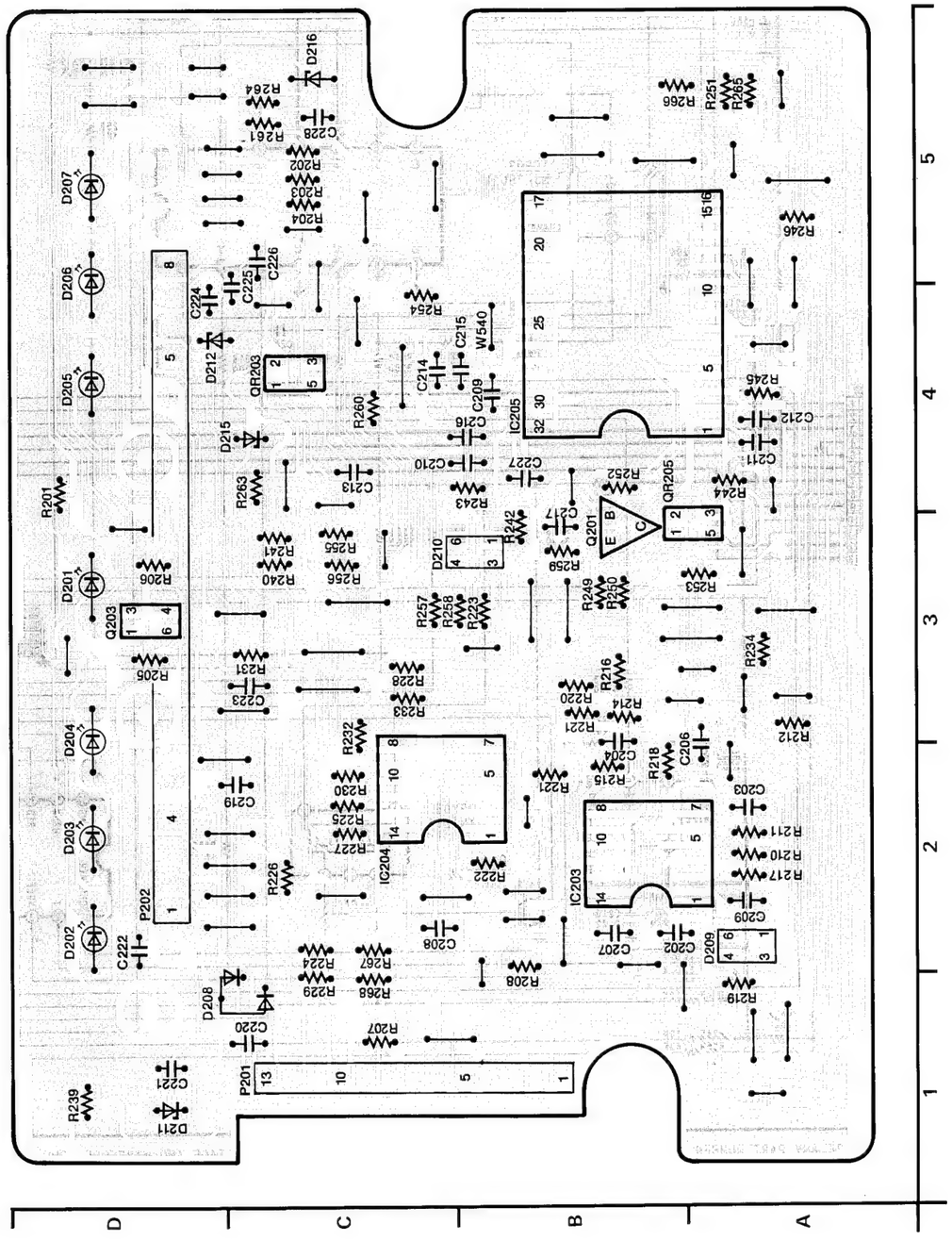
IMPORTANT SAFETY NOTES:
COMPONENT IDENTIFIED THE MARK ⚠ HAVE THE SPECIAL CHARACTERISTICS FOR SAFETY.
WHEN REPLACING OF THESE COMPONENTS, USE ONLY THE SAME TYPE.

HOT CIRCUIT BE CAREFUL AND USE AN ISOLATION
TRANSFORMER WHEN SERVICING.

MAIN C.B.A. (VEP61266A)

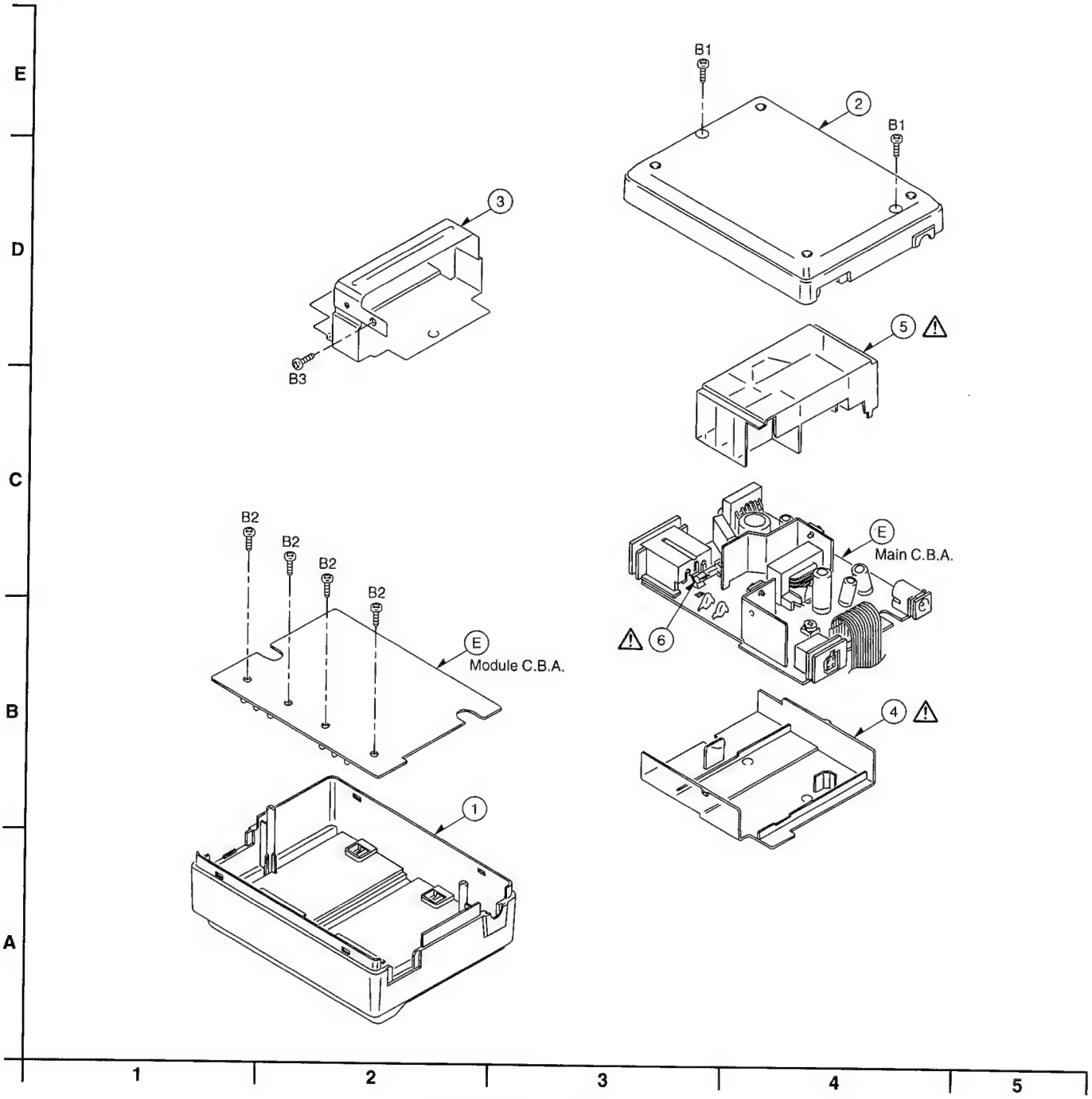


MODULE C.B.A. (VEP60567A)



3. EXPLODED VIEWS & MECHANICAL REPLACEMENT PARTS LIST

❶ AC ADAPTOR SECTION

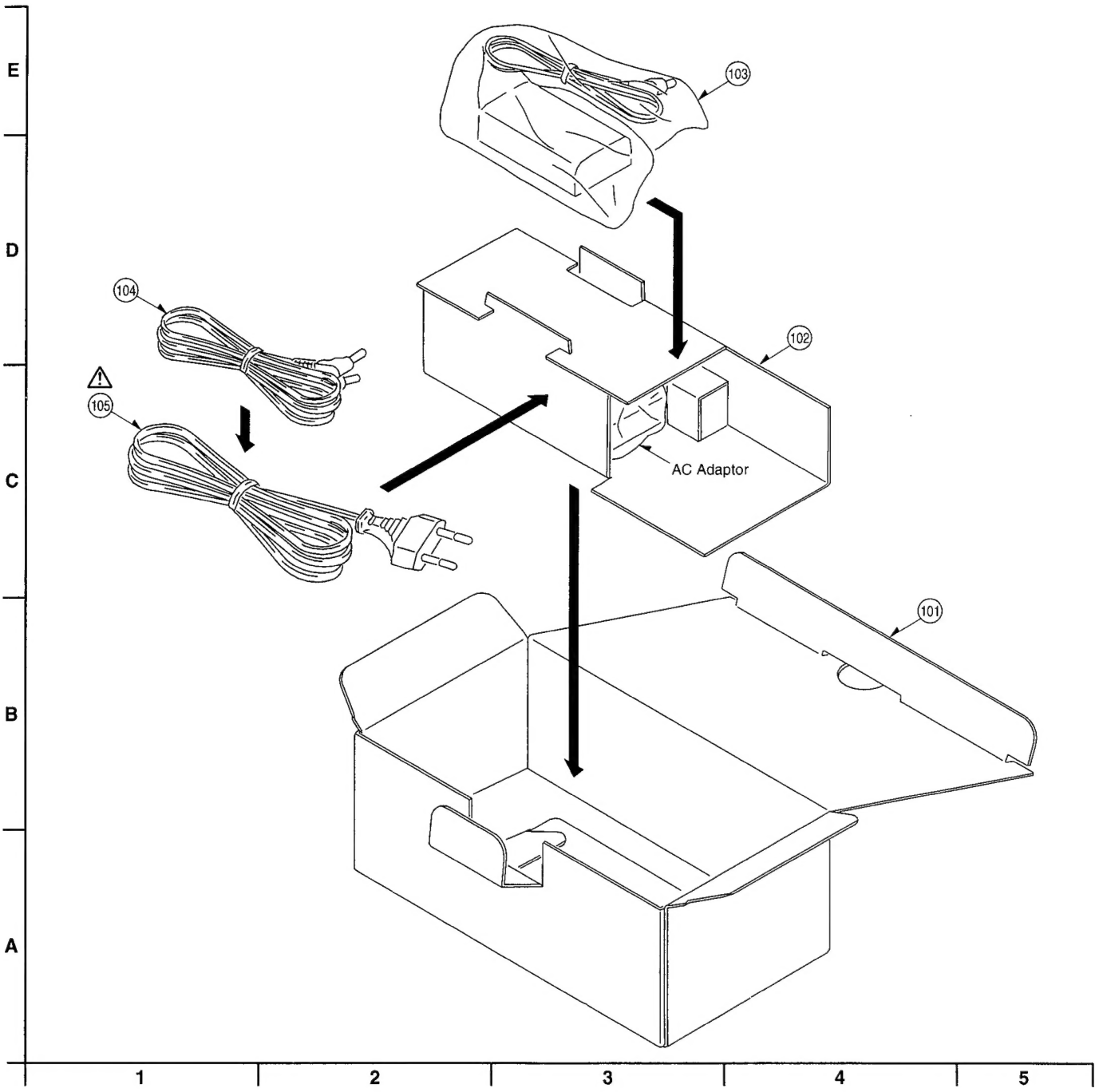


Note: 1. *Be sure to make your orders of replacement parts according to this list.
2. IMPORTANT SAFETY NOTICE
Components identified with the mark ⚠ have the special characteristics for safety. When replacing any of these components, use only the same type.

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
1 (1)	VYK8542	TOP CASE U.	1	
2 (1)	VKM4877	BOTTOM CASE U.	1	
3 (1)	VSC4732	SHIELD CASE	1	
⚠ 4 (1)	VMZ2744	TOP BARRIER	1	
⚠ 5 (1)	VMZ2745	BOTTOM BARRIER	1	
⚠ 6 (1)	XBA2C10TB0L	FUSE	1	
B1 (1)	XTB2+8GFZ	SCREW	2	
B2 (1)	XQN2+C66FZ	SCREW	4	
B3 (1)	XTB26+6G	SCREW	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks

❷ PACKING & ACCESSORIES SECTION



Note: 1. *Be sure to make your orders of replacement parts according to this list.
2. IMPORTANT SAFETY NOTICE
Components identified with the mark ⚠ have the special characteristics for safety. When replacing any of these components, use only the same type.

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
101 (2)	VPG8522	PACKING CASE U.	1	
102 (2)	VPN4784	PAD	1	
103 (2)	VEK8328	DC CABLE U.	1	
104 (2)	VJA1088	DC CABLE	1	
⚠ 105 (2)	VJA0998	AC CABLE	1	VW-AD7E
⚠ 105 (2)	VJA0940	AC CABLE	1	VW-AD7B
⚠ 105 (2)	VJA0754	AC CABLE	1	VW-AD7A

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks

4. ELECTRICAL REPLACEMENT PARTS LIST

Note: 1. Be sure to make your orders of replacement parts according to this list.
2. IMPORTANT SAFETY NOTICE: Components identified with the mark ⚠ have the special characteristics for safety. When replacing any of these components, use only the same type.
3. Unless otherwise specified,
All resistors are in OHMS, K=1,000 OHMS. All capacitors are in MICROFARADS (uf), P=uuF.
4. The P.C. Board units marked width "■" show below the main assembled parts.
5. The marking (RTL) indicaters the retention time is limited for this item.
After the discontinuation of this assembly in production, it will no longer be available.

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
⚠ ■	VEP61266A	MAIN C. B. A.	1	(RTL)
■	VEP60567A	MODULE C. B. A.	1	(RTL)
⚠ F01	XBA2C10TB0L	FUSE	1	
⚠ ■	VEP61266A	MAIN C. B. A.		(RTL)
⚠ C01	VCF0183M473	POLYESTER FILM CAPACITOR	1	
⚠ C02, 03	VCK0258M102	CERAMIC CAPACITOR	2	
C04	VCEA2GAT330	E. CAPACITOR 400V 33U	1	
C05	ECQE2473KF	P. CAPACITOR 250V 0. 047U	1	
C06	ECCZ3A560KGE	C. CAPACITOR 1KV 56P	1	
C07	ECA1HHG3R3	E. CAPACITOR 50V 3. 3U	1	
C08	ECA0JHG471	E. CAPACITOR 6. 3V 470U	1	
C09	ECUM1H102KBN	C. CAPACITOR CH 50V 1000P	1	
C10	ECUM1C224KBN	C. CAPACITOR CH 16V 0. 22U	1	
C21	EEUFA1C821	E. CAPACITOR 16V 820U	1	
C22	ECA1CHG471	E. CAPACITOR 16V 470U	1	
C23	ECA1VHG101	E. CAPACITOR 35V 100U	1	
C24	ECEA1CKG100	E. CAPACITOR 16V 10U	1	
C25	ECUM1E104ZFN	C. CAPACITOR CH 25V 0. 1U	1	
D01	S1WBA80	DIODE	1	
D02	ERA22-08	DIODE	1	
D03	MA185	DIODE	1	
D04	MA4360L	DIODE	1	
D21	F5KF20	DIODE	1	
D22	MA185	DIODE	1	
D23	MA4120	DIODE	1	
D24	MA185	DIODE	1	
D25	MA165VT	DIODE	1	
⚠ DZ01	ERZVA5D471	TRANSIENT/SURGE ABSORBER	1	
⚠ FL01	ELF15N003A	LINE FILTER	1	
IC01	MIP0224SY	IC	1	
IC21	UPC78N05H	IC	1	
JK21	VJJ0576	DC JACK	1	
JK22	VJJ0608	DC JACK (4P)	1	
L21	VLP0056	COIL	1	
L22	VLP0137	COIL	1	
⚠ P01	VJS3306	AC INLET	1	
P02	VWJ13NB070Q0	FLAT CARD CABLE	1	
⚠ PC01	PC123FY2	PHOTO COUPLER	1	
Q01	XN4601	TRANSISTOR-TRANSISTOR	1	
Q21, 22	2SA1897	TRANSISTOR	2	
QR21	XN1214	TRANSISTOR-RESISTOR	1	
R01	ERG2SJ683	M. RESISTOR 2W 68K	1	
R02	ERJ8GEYJ330	M. RESISTOR CH 1/8W 33	1	
R03	ERDS2TJ220	C. RESISTOR 1/4W 22	1	
R04	ERDS2TJ272	C. RESISTOR 1/4W 2. 7K	1	
R05	ERJ6GEYG102	M. RESISTOR CH 1/10W 1K	1	
R06, 07	ERJ6GEYG474	M. RESISTOR CH 1/10W 470K	2	
R08	ERJ6GEYG102	M. RESISTOR CH 1/10W 1K	1	
R22	ERX1SZGR10	M. RESISTOR 1W 0. 1	1	
R23	ERG2SJ151	M. RESISTOR 2W 150	1	
R24	ERJ6GEYG512	M. RESISTOR CH 1/10W 5. 1K	1	
R25	ERJ6GEYG152	M. RESISTOR CH 1/10W 1. 5K	1	
R26, 27	ERJ8GEYJ151	M. RESISTOR CH 1/8W 150	2	
R28	ERJ6GEYG102	M. RESISTOR CH 1/10W 1K	1	
R29, 30	ERJ8GEYJ151	M. RESISTOR CH 1/8W 150	2	
⚠ T01	VLT0905	TRANSFORMER	1	
VR21	EVMF6SA00B14	V. RESISTOR 10K	1	
		MISCELLANEOUS		
	VSC4733	HEAT SINK	1	
	XTB26+6G	SCREW	2	
	VSC4744	SHIELD COVER	1	
■	VEP60567A	MODULE C. B. A.		(RTL)
C202	ECUM1E104ZFN	C. CAPACITOR CH 25V 0. 1U	1	
C203-06	ECUM1E104KBN	C. CAPACITOR CH 25V 0. 1U	4	
C207	ECUM1C105ZFN	C. CAPACITOR CH 16V 1U	1	
C208, 09	ECUM1E104ZFN	C. CAPACITOR CH 25V 0. 1U	2	
C210	ECUM1C224KBN	C. CAPACITOR CH 16V 0. 22U	1	
C211-16	ECUM1E104ZFN	C. CAPACITOR CH 25V 0. 1U	6	
C217	ECUX1E104ZFV	C. CAPACITOR CH 25V 0. 1U	1	
C219	ECUX1E104ZFV	C. CAPACITOR CH 25V 0. 1U	1	
C220	ECUM1E104ZFN	C. CAPACITOR CH 25V 0. 1U	1	
C221	ECUX1E104ZFV	C. CAPACITOR CH 25V 0. 1U	1	
C222	ECUM1E104ZFN	C. CAPACITOR CH 25V 0. 1U	1	
C223-25	ECUX1E104ZFV	C. CAPACITOR CH 25V 0. 1U	3	
C226	ECUM1E104ZFN	C. CAPACITOR CH 25V 0. 1U	1	
C227, 28	ECUX1E104ZFV	C. CAPACITOR CH 25V 0. 1U	2	
D201	LN276RPX	DIODE	1	
D202-07	LN376GPX	DIODE	6	
D208	MA152WA	DIODE	1	
D209, 10	MA128	DIODE	2	
D211, 12	MA3062M	DIODE	2	
D215, 16	MA3062M	DIODE	2	
IC203	NJM2902M	IC	1	
IC204	NJU7034M	IC	1	
IC205	LU5K6B84	IC	1	
P202	VEK8306	BATTERY CATCHER	1	
Q201	2SD601A	TRANSISTOR	1	
Q203	XN4601	TRANSISTOR-TRANSISTOR	1	
QR203	XN1114	TRANSISTOR-RESISTOR	1	
QR205	XN1211	TRANSISTOR-RESISTOR	1	
R201	ERJ6GEYG331	M. RESISTOR CH 1/10W 330	1	
R202-04	ERJ6GEYG181	M. RESISTOR CH 1/10W 180	3	
R205, 06	ERJ6GEYG392	M. RESISTOR CH 1/10W 3. 9K	2	
R207	ERJ3RBD123	M. RESISTOR CH 1/16W 12K	1	
R208	ERJ3RBD133	M. RESISTOR CH 1/16W 13K	1	
R210	ERJ3GEYG332	M. RESISTOR CH 1/16W 3. 3K	1	
R211	ERJ3GEYJ103	M. RESISTOR CH 1/16W 10K	1	
R212	ERJ6RED134	M. RESISTOR CH 1/10W 130K	1	
R213	ERJ3RBD392	M. RESISTOR CH 1/16W 3. 9K	1	
R214	ERJ3GEYG332	M. RESISTOR CH 1/16W 3. 3K	1	
R215	ERJ3GEYG102	M. RESISTOR CH 1/16W 1K	1	
R216	ERJ6GEYG102	M. RESISTOR CH 1/10W 1K	1	
R217, 18	ERJ3GEYG332	M. RESISTOR CH 1/16W 3. 3K	2	
R219	ERJ3GEYJ221	M. RESISTOR CH 1/16W 220	1	
R220	ERJ6GEYG102	M. RESISTOR CH 1/10W 1K	1	
R221	ERJ6RBD102	M. RESISTOR CH 1/10W 1K	1	
R222	ERJ3RBD243	M. RESISTOR CH 1/16W 24K	1	
R223	ERJ3GEYG472	M. RESISTOR CH 1/16W 4. 7K	1	
R224, 25	ERJ6RBB473	M. RESISTOR CH 1/10W 47K	2	
R226	ERJ6RED204	M. RESISTOR CH 1/10W 200K	1	
R227	ERJ3RBD104	M. RESISTOR CH 1/16W 100K	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
R228	ERJ3GEYG472	M. RESISTOR CH 1/16W 4.7K	1	
R229, 30	ERJ6RBB473	M. RESISTOR CH 1/10W 47K	2	
R231	ERJ6RED204	M. RESISTOR CH 1/10W 200K	1	
R232	ERJ3RBD104	M. RESISTOR CH 1/16W 100K	1	
R233	ERJ6GEYF472	M. RESISTOR CH 1/10W 4.7K	1	
R234	ERJ3GEYJ103	M. RESISTOR CH 1/16W 10K	1	
R239	ERJ8GEYJ122	M. RESISTOR CH 1/8W 1.2K	1	
R240, 41	ERJ6RBD103	M. RESISTOR CH 1/10W 10K	2	
R242	ERJ3GEYJ224	M. RESISTOR CH 1/16W 220K	1	
R243	ERJ6GEYG222	M. RESISTOR CH 1/10W 2.2K	1	
R244	ERJ6GEYG103	M. RESISTOR CH 1/10W 10K	1	
R245	ERJ3GEYJ103	M. RESISTOR CH 1/16W 10K	1	
R246	ERJ6GEYG103	M. RESISTOR CH 1/10W 10K	1	
R249	ERJ3RED164	M. RESISTOR CH 1/16W 160K	1	
R250	ERJ3RBD243	M. RESISTOR CH 1/16W 24K	1	
R251	ERJ6RBD562	M. RESISTOR CH 1/10W 5.6K	1	
R252	ERJ6GEYG433	M. RESISTOR CH 1/10W 43K	1	
R253	ERJ6GEYG102	M. RESISTOR CH 1/10W 1K	1	
R254	ERJ6RBD273	M. RESISTOR CH 1/10W 27K	1	
R255, 56	ERJ6GEYF472	M. RESISTOR CH 1/10W 4.7K	2	
R257, 58	ERJ3GEYJ103	M. RESISTOR CH 1/16W 10K	2	
R259	ERJ3GEYJ433	M. RESISTOR CH 1/16W 43K	1	
R260	ERJ6GEYF472	M. RESISTOR CH 1/10W 4.7K	1	
R261	ERJ3GEYG472	M. RESISTOR CH 1/16W 4.7K	1	
R263, 64	ERJ3RBD103	M. RESISTOR CH 1/16W 10K	2	
R265	ERJ6RBD751	M. RESISTOR CH 1/10W 750	1	
R266	ERJ6RBD332	M. RESISTOR CH 1/10W 3.3K	1	
R267, 68	ERJ6RBB473	M. RESISTOR CH 1/10W 47K	2	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks

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